The American

GAS LIGHT JOURNAL.

(ILLUSTRATED.)

DEVOTED TO THE INTERESTS OF

ILLUMINATION, HEATING, MECHANICAL, CHEMICAL

AND

GENERAL SCIENCE.

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(FIFTIETH YEAR.)

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BRIEFLY TOLD.

USE THE FOUNDER SOCIETIES' LIBRARY.—Mr. Joseph Struthers, Chairman of the House Committee, Engineering Societies, Home Building, 29 West 39th street, New York city, writing on behalf of the Library Committee, recently addressed the following letter to the executives of the American Gas Institute:

ENGINEERING SOCIETIES,
OFFICE OF SUPERINTENDENT OF BUILDING,
29 WEST 39TH STREET.

American Gas Institute,
29 West 39th street, City.

Dear Sirs: You are hereby officially notified that the Library of the Founder Societies in this building is open daily, from 9 A.M. to 9 P.M. Members of your Society are cordially invited to make use of the privileges of the Library, under the following regulations:

"Members of your organization who desire to use the Library will apply before 5 P.M. to the Secretary of one of the Founder Societies for the application card of admission. In case application cannot be made until later than 5 P.M., proper credentials (either a membership card or a letter from the Secretary of the Associate Society) should be presented to the Librarian-in-charge."

EXECUTIVE COMMITTEE MEETING, SOUTHWESTERN ELECTRICAL AND GAS ASSOCIATION.—An important meeting of the above-named Committee was recently held in the Juanita Building, Dallas, Tex., which was attended by the following: H. T. Edgar, W. B. Tuttle, J. P. Crerar, J. D. Oliger, J. F. Strickland, A. E. Judge and H. M. Moore. The meeting was presided over by Mr. Edgar, and Mr. R. B. Stichter occupied the Secretary's desk. Reports from various committees were received and properly disposed of. The Treasurer (Mr. A. E. Judge) submitted a statement respecting the financial condition of the Association for the years 1904–05–06–07, and the figures proved that the current year was the banner one in the history of the Association. A communication was read from Mr. J. A. Arnold, President of the Commercial Secretaries Association, requesting a subscription of $50 to assist in carrying on the work of that body, which organization has for its object the advancement of the manufacturing and commercial enterprises of the State. Favorable action on the request was taken. A communication which had been forwarded by the coal operators in Arkansas, Indian Territory and Texas, and which asked the Association to contribute to a fund to be expended in attempting to secure concession in freight rates for the transportation of coal and oil, was read and discussed. After a lengthy debate it was unanimously decided to decline to participate in the movement at the present time. Next came a communication from Mr. W. W. Freeman, Secretary of the National Electric Light Association, New York city, in which was suggested the fostering of closer co-operation between the various local organizations, with a view to strengthening the bond between them and the central body. The Secretary was instructed to reply to the effect that the Association was not only willing but anxious to work along the lines suggested, and to thank the central body for its invitation. A communication was received from Mr. Walter M. Smith, Librarian of the University of Wisconsin, in which the University asked the Association to send to the University copies of all publications issued by it, in return for which the University agreed to forward the Association copies of the engineering bulletins published by the former. This, of course, was agreed to. It was decided that the members of the Executive Committee should confer with the General Passenger Agents of the different railroads of the State with a view to obtaining reduced travelling rates for the next convention of the Association, which sessions will be held in El Paso, Tex., at a time in May not yet definitely settled upon. President Edgar, Secretary Stichter and Mr. J. A. Myler, Jr., Manager of the Dallas Gas Company, were appointed a committee to arrange for papers to be read at the convention. The question of exhibits for the El Paso meeting was brought up, and it was the understanding of the Executive Committee, so expressed, that as this matter was in the hands of a Committee of the supply men (that Committee was appointed at the last, or San Antonio, convention), the President should take the subject up with them. The Secretary was instructed to gather such information, as directed by the President, regarding taxes, both *ad valorem* and special, cost of street improvements, and other municipal jottings of interest. It was especially to be impressed upon the members that this information be imparted to the Secretary in as complete shape as possible, such information to be filed in the office of the Secretary, and to be accessible to members only. The meeting was a brisk one and the general sense of those who shared in it was to the effect that while the prevailing unrest in financial circles had to some extent adversely affected the lighting interests of the Southwest, it was also the feeling that no other interest had stood the shock so well. We are indebted to Secretary Stichter for this synopsis of the meeting.

JANUARY MEETING, SOCIETY OF MECHANICAL ENGINEERS.—We are indebted to Mr. S. E. Johnston, Editor of the Society's publications, that the January meeting will be held the evening of Tuesday, 14th

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inst., in Assembly Room, No. 1, Engineering Societies Building. This session will have especial interest for the gas fraternity, in that a paper on "Car Lighting," by the President of the Safety Car Heating and Lighting Company (Mr. R. M. Dixon) will be read. Mr. Dixon will, however, treat of the general subject of the lighting of trains, showing the relative economies of several systems. It is proposed to have in operation exhibits of different methods, several of which are novel, notably a new acetylene system. The mantle methods will be fully described, as will also several types of axle-generated electric systems. The regulating and governing mechanism of some of these types will be interesting and novel to the average gas man. It is well to remember that each member of the Society may bring a friend along.

CURRENT COMMENT.—

MR. S. K. CAMPBELL has been appointed General Superintendent of the Nassau and Suffolk Lighting Company, with headquarters at Hempstead, Long Island. The appointment, which became effective the 1st inst., rather goes to show that the Public Service Corporation of New Jersey lost a good man when it accepted Mr. Campbell's resignation from its Plainfield division last winter, and it further goes to show that President George MacDonald is ready to recognize merit.

"PRESIDENT," writing under recent date, forwards the following interesting "Chat:" "As you perhaps know, I lately made a trip to the Pacific Coast, returning therefrom only a few days ago. Business seems to be pretty lively in the Northwest, but the Southern part of California seems somewhat crippled, owing mainly to the financial conditions. Mr. H. M. Papst, who was appointed General Manager of the Portland (Ore.) Gas Company, one year ago last August, has surely increased the output there wonderfully, as the following figures will certainly prove. During last October about 70 per cent. more gas was sold than in October, 1906, although the mileage of mains was increased only 25 per cent. About 2,300 more meters are in use than, say, at this time a year ago. The number of gas arcs in service totals 9,000 as against 6,900, and a striking feature of the public illumination is in the maintaining on private account of 200 or so gas arcs right in the business section of the city. I might have mentioned that the property owners pay for every post set. The receipts from the sale of appliances alone will well exceed $130,000 the past year. The gas output for 1906 exceeded 640,000,000 cubic feet, and the Christmas maximum output for 24 hours may be safely set at 4,000,000 cubic feet—thus reaching the total generating capacity of the plant. In order to get away from such close propinquity to the saturating point the Company has, through Mr. E. Howard Corbett, of the Hallidie Machinery Company, of Seattle, Wash., placed an order with the Gas Machinery Company, of Cleveland, O., for two of the latter's 12-foot improved oil gas sets. This apparatus will enable the Portland folks to easily send out 8 millions cubic feet per diem. Surely, Mr. Papst is not of the waiting sort. He prefers to put his house in order, and to keep it 'put.'"

MR. WILLIAM CLAUSS, President of the Cincinnati Gas Coke, Coal and Mining Company, was presented with a beautiful loving cup the afternoon of the 26th ult., by the members of the Louisville (Ky.) branch of the named Company.

MR. H. M. BRENNAN has resigned the position of City Gas Inspector to the city of Louisville, Ky. The resignation became effective the 1st inst. Politics only had to do with this action. He would have been removed by Mayor Grinstead had he not resigned. Yet during his term in the office he had shown great ability for its duties.

THE Massachusetts Board of Gas and Electric Light Commissioners has authorized the Brockton Gas Light Company to issue $110,000 additional capital stock and $100,000 bonds, to run for 20 years, and to bear 5 per cent. interest.

THE Chicago newspapers of recent date hint that important changes are to occur in the directorate of the Peoples Gas Light and Coke Company, at the annual election, which is to be held the 10th prox. The wiseacres have it that Messrs. Anthony N. Brady and A. R. Flower will retire from the Board, and that their successors will be named by Mr. C. K. G. Billings, who will be chosen Chairman of the Board.

WE understand that the Brooklyn Union Gas Company's proprietors are arranging the preliminaries for a comprehensive plant betterment scheme that will involve an expenditure going into very high figures.

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PROCEEDINGS AMERICAN GAS INSTITUTE, SECOND ANNUAL MEETING, HELD AT THE NEW WILLARD HOTEL, WASHINGTON, D. C., OCTOBER 16, 17 AND 18, 1907.

SECOND DAY—MORNING SESSION

DISCUSSION ON THE GARTLEY REPORT—CONCLUDED.

Mr. Klumpp—I do not know whether this discussion has been closed by what Mr. Gartley just said, but I would like to take just a moment. The point I seek to bring out is the difficulty of comparing an electric vacuum standard with an open flame standard, or *vice versa*. Those comparisons can only be made under certain atmosperic conditions, and I think that gas men should appreciate this. It would be practically impossible for the average gas company to use an electric standard in determining the candle power of its gas. True comparison could only be made under certain normal conditions of humidity and vitiation, and it would be next to impossible to obtain such conditions the greater part of the year. For instance, during July and August, when the air is heavily laden with moisture, it would be necessary to reduce this excessive quantity of water vapor by artificially drying the air, or by the introduction of some correcting factor obtained by careful experiment. Conversely would be the effect of the excessively dry state of the atmosphere during the months of January and February needing correction. The work of comparing a vacuum electric lamp against an open flame can only be correctly done by experienced observers, and then only with the use of exact instruments and good laboratory equipment to carefully observe and record the conditions of the atmosphere. Owing to this difficulty I think I am safe in saying not one gas company in 100 has the equipment to attempt to make such comparisons with definite results.

Mr. R. Norris—On one point in this connection I would like to say a word. It is sometimes assumed that, because a franchise or ordinance specifies the gas sent out under such franchise or ordinance must be of a quality that will give a light equal to so many standard sperm candles, the test must be made against actual candles. I think this position is in error, and that the test can be made against any reliable secondary standard the value of which may be expressed in terms of the ordinary candle. It is important to bear this in mind, for it is a mistake often made.

Mr. A. S. Miller—I think this matter is one of very great importance and that the good work ought to go on. I move that this Committee be discharged with the thanks of the Association, and that the work be referred to the Technical Committee, with the request that it be continued. [Seconded.]

The President—Gentlemen, you have heard Mr. Miller's motion. Any remarks? All in favor of this say "Aye." Contrary minds, "No." [Carried.] The next business in order is the

REPORT OF THE PUBLIC POLICY COMMITTEE.

That was presented by Mr. W. H. Gardiner, as follows:

This Committee is new to the American Gas Institute, and, therefore, it conceives that in this, its first report, it should state what it believes to be the intent of its appointment and the scope of the work with which it is intrusted.

The gas business, of which the American Gas Institute is the national representative, embraces matters and relations of a physical, engineering and financial nature, and relations to and with its patrons, the public, and the official representatives of the latter. We believe that the intent in appointing this Committee was to establish an organization within the Institute, which should consecutively, progressively and constructively study, suggest and report upon any subject touching the relations of gas companies to their customers, their employees, the public and its officials; in brief, all matters of public policy, or relations as distinguished from engineering matters, and matters internal to the operation of a gas company.

In this connection we would note that the other Associations in the public service, the American Street and Interurban Railway Association, and the National Electric Light Association, have similar standing committees, and we are happy to report at this time that permanent relations have been established with these other committees for mutual co-operation in the study and evolution of our relations to the public.

In this era of social unrest, it is evident that conditions and relations, which in the past may have been satisfactory, are perhaps no longer so.

Your Committee, conforming with the action of the other committees above mentioned, has attempted, first, to ascertain those items of our relations to the public most in evidence; and second, to study suggestions and means for their improvement. But we have not deemed the time ripe as yet, or our studies to have progressed sufficiently, to warrant more advanced action.

To facilitate this student work the Committee first elected Mr. W. H. Gardiner, of New York, its Secretary, and was then organized by appointments by its Chairman into the following sub-Committees:

"Pubic Regulation and Control;" Mr. F. W. Little, Chairman, and Mr. A. P. Lathrop.

"London Sliding Scale as Applied to Gas;" Mr. John Williamson, Chairman, and Mr. W. H. Gardiner.

"Taxation and Franchises;" Mr. Paul Thompson, Chairman, and Mr. F. W. Little.

"Industrial Insurance, Rewards and Pensions;" Mr. A. P. Lathrop, Chairman, and Mr. Irvin Butterworth.

"Publicity and Popular Education;" Mr. Irvin Butterworth, Chairman, and Mr. Paul Thompson.

Appended to this report are the reports of these sub-Committees, excepting only that of the sub-Committee on Taxation and Franchises which did not make a report. We trust that each one of these reports will receive the careful consideration of our members, as each deals with a problem the best solution of which would materially contribute to the improvement of our public relations; but at this time we have no recommendations to make beyond the submission of these reports to your attention, and the statement that, in the field of work undertaken this year by your Committee, we find great scope and opportunity for study, improvement and co-operation. We, therefore, trust that the Institute will continue a Committee in this work.

Respectfully submitted,

E. G. COWDERY, Chairman,
W. H. GARDINER, Secretary,
IRVIN BUTTERWORTH,
A. P. LATHROP,
F. W. LITTLE,
PAUL THOMPSON,
JOHN WILLIAMSON,
} Committee.

Report of the Sub-Committee on Public Regulation and Control to the Public Policy Committee of the American Gas Institute.

The report of the Secretary of the Public Policy Committee shows that many measures have been before the legislatures of the various States during the past winter, having for their object some form of supervision and regulation of public service corporations. Important legislation affecting public utilities has been adopted in New York, Wisconsin and Missouri, and similar action may be expected in other States.

The traditional policy of the Federal Government and of most of the States of the United States has from the beginning been to rely upon individual initiative and open competition, either active or potential, to bring about fair prices for products not only of general merchandise, but for those particular services rendered by public utilities. These competitive conditions, even when but potential, necessarily require secrecy in accounting, since a producer could not justly be required to expose the details of his accounts and practically his entire business to a competitor.

During the 80-odd years which have elapsed since gas was first introduced into America, this system has worked with a fair degree of satisfaction to both consumer and investor. The rule has been substantially uniform, that each decade has required every gas company to double its investment to adequately respond to the demands of its increasing number of consumers scattered over an ever increasing area. Throughout the greater part of the country, local supplies of capital have been insufficient to meet local demands for improvements and extensions, and these demands have only been met by the inflow of capital from other sections where local demands were less and supplies greater.

Considering the area per unit of population embraced within the corporate limits of most American municipalities, the rapid antiquation of manufacturing and distributing plants, due to increasing growth and the shifting of residential and business centers, the insufficiency of local supplies of funds and the frequent swing to-and-fro of the pendulum of general prosperity, the system which has prevailed may fairly be said to have worked well as applied to the gas business as a whole. Public obligations to furnish sufficient supplies of gas at fair prices have been generally well met while investors have had a fair return for the use of their money.

Now, however, in response to the demand for governmental supervision or regulation of all public utilities, and as an alternative to municipal ownership and operation, it is proposed to substitute for the old conditions a system of State supervision and regulation of gas companies through the medium of commissions. Your sub-Committee believes that this movement is not inherently antagonistic to the best interests of the public and of the owners of gas properties, and recommends that it be met in a fair and friendly spirit in an effort to direct it into just, equitable and conservative channels, to the end that initiative, progress and fair dealing be stimulated, and antagonism and unfairness be eliminated.

The public may rightfully demand ample supplies of gas at the lowest possible prices consistent with a fair return upon the value of the property devoted to its use, and there seems no natural reason why the interests of the public and the interests of the owners of gas properties should not run together. When the State takes over the supervision and control of private property devoted to a public use, it is in duty bound to afford a full measure of protection to that property as well as like protection to further capital which may be invested in response to the public demand.

If supervisory and regulating commissions are to be constituted, the members should receive their appointments directly from the State, their term of office should be lengthy, and their compensation adequate, to the end that efficient and trustworthy men may afford to hold these positions; and their terms should expire at different times so that at all times a majority of the members may have the benefit of the past experience of the Commission and the Commission itself maintain a consistent policy. Members of the Commission should be removable only for cause, and such other safeguards should be thrown around their tenure of office as to make the position non-political on the one hand and free from improper influences on the other.

Every law creating supervisory commissions should contain within itself clearly stated rules by which the acts of the commission should be guided. The powers and responsibilities of the commission should be as clearly defined as the powers and responsibilities of the corporations whose acts it is proposed to regulate, and the operation of the law should be as nearly automatic as is possible.

The conclusions of your Sub-Committee are:

A.—That the change from the policy of open competition as a regulating force, and from secret accounting to State supervision and regulation with public accounting, is not inimical to the interests of the owners of gas properties, provided that it is accompanied by protection to the values of the properties supplying the public need. Such protection is as necessary to the public interest as to the corporations, since without it capital cannot be secured to make necessary extensions and improvements.

B.—Commissions should be appointed in such a manner and be assured of such a tenure of office as will make them free from political dictation and from the pressure of a local sentiment which might prevent them from dealing justly with the public and private interests before them.

C.—Commissions should regulate the granting of all franchises, should adopt and have power to enforce a uniform system of accounting, auditing and reporting, and should protect the interests of the users of gas and the companies supplying the same. While securing these results to the public the aim of the Commission should be to encourage in every legitimate way individual enterprise and initiative.

Respectfully submitted, F. W. LITTLE, Chairman,
A. P. LATHROP.

Report of the Sub-Committee on the London Sliding Scale, as Applied to Gas, to the Public Policy Committee of the American Gas Institute.

Some of the present antagonism of the public toward public service corporations originates in claims of improper or inadequate service, but in the great majority of cases this public antagonism is founded on a popular belief that charges for service are too high. On the other hand, owners and managers of public service enterprises assert that charges are now so low, and there is such public unrest, that adequate dividends cannot be paid, and the moneys necessary for improvements and extensions cannot be obtained for this reason, and because of the supposed present insecurity of public service enterprises.

The public wants excellent and adequate service at the minimum price possible, while the public service companies want the maximum net earnings and perfect security to their enterprises. In many instances at present neither the public nor the companies believe that they are being properly served or treated in any of these respects, each by the other.

The London sliding scale would seem to give promise of eliminating these several opposing interests and their resultant antagonism, and this by linking the self-interests of each party to those of the other so that their ends are mutually and simultaneously satisfied. Higher dividends are promised and assured as an incentive to lower prices, and the lowest possible prices are assured, since maximum dividends can result only from the minimum possible price. The relation of price to dividend and *vice versa* is by the sliding scale established in a constant inverse ratio, one to the other, which yields not only ever decreasing prices and hence ever increasing allowable dividends, but also it assures both in a constant ratio which endows the situation with an equity and security otherwise unobtainable.

Other methods of public control of gas companies and of regulation of their prices and service seek to accomplish their ends generally by restrictive or prescriptive ordinances, rulings and legislation, or by arbitrary bargains which usually are or become more or less inequitable to one or all parties thereto. These bargains may be dismissed without further consideration merely because they are not of a permanent nature nor in the aggregate are they based on homogeneous and established principles. Restrictive and prescriptive legislation, seeks to obtain its ends—especially in regulating prices—by commanding companies to conform to conditions which will allow of their making and paying but the minimum legal return under the United States Constitution. Obviously a series of such actions will eliminate any direct incentive to make improvements in service and reductions in price. For, as no increase in direct profit is tolerated, why seek to improve when improvement is profitless?

The London sliding scale on the contrary offers a direct and proportional incentive to improvement. It is based on the theorem that self-interest is the greatest stimulus of material progress and efficiency. Instead of seeking improvements for the public by constantly wielding the public "Big Stick" it obtains them by allowing public service companies to pay ever increasing profits, but only in direct proportion to the improvements in service and its price that the company gives to the public.

Although established and in successful operation for many years in England, the sliding scale is of recent importation to this country. But happily now we can get data of its workings in this country from the case of the Boston Consolidated Gas Company which has been operating under this system for some time.

We may perhaps best summarize the results in the Boston gas situation by quoting in part a public statement, issued June 24th, 1907, by Louis D. Brandeis, Esq. In explanation it should be noted that Mr. Brandeis is considered the dominant personality in the Public Franchise League of Massachusetts, which has been and is very active in legislative matters when it conceives that it can foster or protect the interest of the public. He said in part:

"The reduction in the price of gas just announced by the Boston Consolidated Gas Company, from 85 cents to 80 cents per 1,000 feet, is an event of more than local or passing significance. The reduction follows quickly after three other reductions in the price of gas made by the Company within a period of 2 years; the first, July 1, 1905, from $1 to 95 cents; the second, Jan. 1, 1906, to 90 cents; the third, July 1, 1906, to 85 cents.

"To have made a reduction in price of 20 per cent. during so short a period, in which prices for labor and materials have risen so largely, is certainly a remarkable achievement. It will mean a saving to the people of Boston next year of $800,000 over what gas would have cost them at the old price of $1 if the estimated consumption of 4 billion feet is reached.

"Fortunately the results to the stockholders of the Company have also been eminently satisfactory, and they may hope soon to reap their just share under the law of this remarkable achievement. The common stock of the Massachusetts Gas Company (which owns the Boston Consolidated Gas Company) has been put meanwhile upon a regular dividend basis, and already pays 3 per cent. per annum. Since April, 1905, the market price of the common stock has risen from 44½ to 57¼. To appreciate how great this rise actually is we must bear in mind the heavy depreciation in stocks generally now as compared with 1905. For instance, the stock of its competitor, the Edison Electric Illuminating Company, of Boston, which sold in April, 1905, at 255, now sells at 206. American Telephone & Telegraph Company, which sold in April, 1905, at 142, now sells at 104½. New York, New Haven & Hartford stock, which sold in April, 1905, at 202, sells now at 160.

"The high price of Massachusetts gas preferred is quite as significant as the rise in common. This preferred stock, limited to a 4 per cent. dividend, sells to-day at only 1½ points less than in April, 1905, although the old, standard, guaranteed stocks, like Boston & Albany and Boston & Lowell, have dropped in price 45 to 48 points as compared with April, 1905. This shows the standing which the Massachusetts Gas has attained as a trust investment."

He goes on to say the following, which we quote merely as he, a public character, considers it a fair statement of pre-eminent importance.

"These great economic gains are not, however, the only, or indeed greatest gains to the community, which the last two years have to record in the Boston gas management.

"[Boston] gas properties, which for the greater part of 20 years have been the subject of financial and political scandal and corruption, exciting the bitterest hostility on the part of the people, have been conducted in a manner so honorable as to deserve and to secure the highest commendation on all hands. The officers and employees of the Company, instead of engaging in lobbying and other political activities, have devoted themselves strictly to the business of making and distributing gas, with such ability and good effect as to attain in an almost incredibly short time for the people, cheap gas; and for the investors, security and the prospect of large returns.

"These remarkable gains are the direct result of the wise, progressive and efficient management of President Richards and his associates, operating under the wise and progressive legislation promoted by the Public Franchise League."

As to the specific methods whereby the results first stated by Mr. Brandeis are obtained, we must summarize the Boston gas sliding scale by saying that a special act of legislature established the standard dividend of the Company as 7 per cent. of the par value of its capital stock and the initial price as 90 cents per 1,000 cubic feet, further providing that reductions of 1 cent per 1,000 each entitled the Company to subsequently increase its rate of dividend by one-fifth of 1 per cent. In other words dropping the price from 90 cents to 80 cents allows of the dividends being raised from 7 per cent. to 9 per cent., and so on proportionately for subsequent and further reductions.

It will be noted that in the Boston gas sliding scale above outlined, a definite increase in the rate of dividend on the capital is the incentive offered for and made proportional to stated reductions of the maximum of gas. This is a direct copy of the plan used for many years in London and would seem to be open to several objections. First, it bases the relation of dividends to reductions in price on what cannot fail to eventually be an arbitrary and more or less inequitable ratio. Speaking of this ratio in London the majority report of the Massachusetts Special State Committee on the sliding scale, which visited England to study this question, says:

"The reasons for the ratio 1d. and of ¼ of 1 per cent. have left no trace in history, and such inquiry as we have been able to make among those prominently identified with the question at the time, fails to disclose the reason for settling upon these precise figures."

In the Boston case the ratio at the outset was not entirely arbitrary, as the annual sales were about three billion cubic feet and the capital stock had a total par value of about 15 million dollars. Therefore as a reduction of 5 cents saved the public $150,000 and as it entitled the Company to pay 1 per cent. ($150,000) additional dividends, the principle of equal division or share-and-share-alike between the public and the Company was established at the outset. But, unfortunately, it was thus permanently established for the reason that obviously the ratio of 15 million dollars of capital to 3 billion cubic feet of sales will not, and in fact has not, been maintained.

On the one hand it might have been and may ever become necessary to increase the capital stock. This under the law entitles the Company to a larger *amount* of premium dividends for every cent. of reduction in price regardless of the volume of sales and of the amount of saving to the public. On the other hand, an increase in consumption in excess of its initial relation to the capital stock does not yield to the Company its proportion to the amount of saving the Company effects for the public.

It would seem to be superfluous to discuss the details of this and other shortcomings of the Boston gas sliding scale, as this has been done in a paper entitled "The London Sliding Scale as a Method for the Government Regulation of Public Service Corporations," presented before the National Electric Light Association in June, 1906, and obtainable from that Association. Appended to this paper is an exhaustive report on the sliding scale in England, and a large English

bibliography on the subject. Suffice it to say here that the proposition discussed in this paper is in effect that a permanently equitable sliding scale should not be based on an arbitrary ratio of the rate of dividend on an arbitrary and changing capitalization, to merely the maximum price per 1,000 feet. The new plan therein suggested is that, after establishing standard conditions, a fair price which shall yield a fair return upon the fair value of the Company as a going concern, the increment dividends allowed as rewards and incentives to price reduction shall be merely *equal in amount* to the savings effected for the public by reducing the price. This ratio or relation is obtained by making them equal in amount to the reductions in the average price (below the initial average price) multiplied by the contemporaneous volume of sales.

While this new system may or may not effect the results claimed by introducing the volume of service into the equation, it is notable in its substitution of the average price for the maximum price. In the present unsettled condition of the rate question, the maximum may evidently become of but very minor import, while the average price of sales to the public is ever the closest index to any public situation as a whole.

In conclusion, your Committee would quote the following paragraphs from the report of a similar Sub-Committee of the Public Policy Committee of the National Electric Light Association for 1907. Their report is pertinent and the following quotations we consider as applicable to gas as electricity. They say:

"Your Committee is not prepared to recommend definitely any particular scheme or method for the application of the theory of the sliding scale as applied to the supply of electricity. It feels that such a recommendation should be postponed until after the matter has had full consideration and discussion. Your Committee is, however, prepared to urge the very serious consideration af the application of this attractive theory to the business of the various companies in interest as soon as a safe and satisfactory working basis for it can be established. Its advantages to the companies, to their customers and to the public are altogether too great to be lost if it is practicable to secure them.

"Your Committee submits the foregoing suggestions in the hope that the subject may be further pursued, not only by a Committee of this Association, but by the individual companies in interest, so that at the next convention of the Association decided progress may be reported and more definite conclusions formulated.

Respectfully submitted, JOHN WILLIAMSON, Chairman.
W. H. GARDINER."

Report of the Sub-Committee on Industrial Insurance, Rewards and Pensions to the Public Policy Committee of the American Gas Institute.

The Committee on Industrial Insurance, Rewards and Pensions is pleased to submit the following report of the various methods in operation, both in this country and abroad, in connection with the above mentioned subject. Our report is to a great extent a copy of a recent report made by a similar Committee of the National Electric Light Association, and we wish to express our thanks to the officers of that Association for the privilege they have granted us of using it.

In addition to the report of the Electric Association we submit complete copies of plans followed by the Milwaukee (Wis.) Gas Light Company and the New Haven (Conn.) Gas Light Company referred to therein, and in addition present methods adopted by the Grand Rapids (Mich.) Gas Light Company, the Columbus (O.) Railway and Light Company and the United States Steel Corporation. There are many excellent plans followed out by the different organizations, and we hope that from some of them the Institute will be able to evolve a plan which it can recommend for general adoption.

ALANSON P. LATHROP, Chairman,
IRVIN BUTTERWORTH.

Report of the Sub-Committee on Publicity and Popular Education to the Public Policy Committee of the American Gas Institute.

Your Committee on the subject of "Publicity and Popular Education" have given it much consideration and have sought the views thereon of a number of leading gas managers. There are three directions in which it is to the interest of gas companies that their respective communities be specially educated:

(1) In the knowledge of the existence, use and economy of the numerous gas appliances for lighting, heating and industrial purposes.

(2) In a broader, fairer and more friendly feeling toward gas companies.

(3) In the doctrine that proper public regulation and control of gas companies are better than municipal ownership.

In promoting the first of the above-mentioned objects, each manager can readily choose and apply any one or more of the numerous well-known publicity and educational methods now in vogue, such as newspaper advertising, pamphlets, circulars, follow-up letters, lectures, solicitors, new business departments, etc. In bettering the present feeling toward gas companies, which, however, is not so hostile as many of us probably imagine, a most effective course is for each individual manager to keep his own "door-yard" scrupulously clean, by means of reasonable rates and good service, and then see that his local newspapers receive authentic information for giving publicity to such gas matters as may be of legitimate interest to their readers.

While now there seems but little tendency toward the municipal ownership of gas works in this country, the popular inculcation, by the gas companies themselves, of the doctrine that public control is better than public ownership, is rather more difficult, for the reason that, being an interested party, their arguments are usually discounted. Undoubtedly the newspapers furnish the best and practically the only effective means of popular education in this matter. If each local manager should so conduct the business of his company that he could "come into court with clean hands," it should be possible, if not comparatively easy, for him to secure, by perfectly frank and open means, the publication, on their merits, in his local newspapers, from time to time, of such items, facts and arguments, selected from the mass that is now readily available to us all, as may serve to prevent his community from coming out on the wrong side of this question. In this connection we commend to the perusal of all gas managers the article entitled "Tainted Publicity," in *Progressive Age*, August 1, 1907. Respectfully submitted,

IRVIN BUTTERWORTH, Chairman.
PAUL THOMPSON.

National Electric Light Association. Report of Sub-Committee on Industrial Insurance, Rewards and Pensions, May, 1907.

To the Committee on Public Policy, National Electric Light Association: Gentlemen—Your Committee on Industrial Insurance, Rewards and Pensions begs leave to submit the following report of the investigations which it has made during the past year of the methods adopted in this country in connection with beneficial associations, pensions and profit-sharing. It has also in its investigations considered the plan that has been in operation for a number of years in the South Metropolitan Gas Company, of London.

Except in a few instances there have been no profit-sharing plans adopted by the utility corporations of this country, and in those instances the profit-sharing has been calculated as a dividend upon the wages of the employees. We find, however, that it is becoming quite prevalent to inaugurate beneficial associations in connection with the operation of utility companies upon plans generally laid down on lines similar to those adopted by the large railway companies of the country.

Your Committee gives to some extent in detail the plan of the Pennsylvania Railroad Company, which is representative of the plans used by the other large railway companies throughout the country. References are also made to the plan that has been in force in Philadelphia for many years, which has been broadened out in the manner given in detail in the report; also the plan in operation in Providence, R. I., the figures of which to date are attached as well as the figures in detail of the operations for a series of years of a beneficiary association organized under the auspices of the employees of a public utility company in one of the large cities of the country; also to the pension order issued by the Boston Elevated Railway Company, 1903; and the profit-sharing plan adopted by the New Haven (Conn.) Gas Light Company and the Milwaukee (Wis.) Gas Light Company.

The purpose of your Committee has been to gather together as much information as possible regarding such associations and such systems of insurance, rewards and pensions as have been adopted throughout the country. While your Committee is aware of the fact that many of the Companies connected with the Associations are operating under conditions that make it impossible for them to have any special organized system to accomplish this purpose, at the same time it feels that wherever it is possible to adopt such plans, or similar plans to those which have been described in this report, it is well to do so; and would further suggest to those companies that cannot at this time, for different reasons, adopt such systems, that they operate as far as possible upon the general principle of doing whatever is pos-

sible to promote the health, happiness and comfort of the employees of their respective organizations.

It might be possible, in the case of the smaller companies, that operatives who have been with these companies for a great many years, who have been faithful and have always worked for the best interests of the company, could be rewarded by a small percentage of increase in pay, commensurate with such services and proportionate to their term of service. As many such operatives have nothing to look forward to for the future in the way of advancement of position, a plan of this kind would give them some inducement to remain with the company and an increasingly bright outlook from year to year. If it is possible, where men have been for a long term of years in service, to place them in positions where their labors can be lightened, such men should be recognized; and if, from old age, they are finally forced to resign, if it is possible and consistent with the demands upon the various companies to pension them at half pay, or at any rate which would give them some consideration, it should be done. The tendency with all such plans is to lighten the burden of the employee, increase his efficiency by reason of the peace of mind that comes from such a condition, and safeguard the interests of the company by encouraging closer, deeper and more harmonious relations between the employee and the company that employs him.

Respectfully submitted, JOSEPH B. MCCALL, Chairman.
J. W. LIEB, JR.

APPENDIX TO REPORT OF SUB-COMMITTEE ON INDUSTRIAL INSURANCE, REWARDS AND PENSIONS.

Profit-Sharing.—The profit-sharing plan of the South Metropolitan Gas Company, of London, a copy of which, with various details, we received through the courtesy of our Secretary, Mr. Gardiner, can be briefly stated as follows:

The officers and employees of the Company who sign the agreement of employment (copy of which is hereto attached) participate in the profits in the form of a percentage upon their salaries, rising and falling with the price of gas and the stuckholders' dividends. The initial rate, when the plan became operative in 1889, was 1 per cent. upon their salaries, based upon gas at practically 50 cents per 1,000 cubic feet. Inasmuch as the London sliding scale, authorized by act of Parliament, entitled the stockholders to an increase in dividends as the price of gas to the consumers was reduced, the plan provided for a proportionate increase in the employees' participation; and, inversely, as the price of gas increased, the dividends and the participation decreased. In fact, the principle of the London sliding scale is the basis of calculation of the profit-sharing plan.

At first the percentage of profits to which every employee was entitled on this basis was paid to him as a cash bonus, with the privilege of permitting the employee to leave his fund on deposit with the Company, at an annual rate of interest.

Sir George Livesey, who was the author of the London sliding scale and also of the profit-sharing scheme that was adopted, states in his paper upon the subject that a great proportion of the employees from the beginning availed themselves of the opportunity of leaving the fund on deposit, while others invested in building stock, and others used it to purchase the Company's stock; but about one-half of the number it was discovered withdrew their bonus as soon as it was paid and, therefore, derived no permanent benefit from the system. These conditions led to a consideration by the Company of some method by which the profit coming to the employees would be invested in such a way as to make a permanent connection between the employee and the Company, with the result that in 1894—after nearly 5 years of trial—a new schedule of rates was made, providing that one-half of the bonus under the schedule to which employees were entitled should be invested by 3 trustees in the Company's ordinary stock, which was then paying 5 per cent. interest, until the amount credited to the employee was sufficient to give him a stock certificate in his own name, the remaining half in all other respects subject to the same conditions as the old schedule; in other words, subject to withdrawal upon notice, or to be left on deposit at 4 per cent. interest. The interest rate on deposits has been changed with the appreciation of the market value of the stock.

As the natural outcome of the purchase of the Company's stock by the employees, the question of representation in the Board of Directors of the Company arose. This happened after the investment of about £20,000 of the fund. There does not appear to have been any reason for this, excepting the broad and general one of educating the workmen to a better understanding of the commercial side of the business, as their holdings in comparison with the total worth of the Company—about £5,000,000—were not entitled to any such consideration. In 1898, when the fund reached £40,000, two Workmen Directors were elected, it being necessary to secure an act of Parliament to enable this to be done. While the wisdom of such policy may be questioned, it is a fact, according to Sir George Livesey's statements, that it has been eminently successful in this case.

These Workmen Directors are voted for by the workmen only—the qualifications being continuous service for not less than 7 years, and the holding for 12 months prior to the election of not less than £100 of the stock of the Company and continuing to hold the same. The method of noting is prescribed in the agreement, and permits 1 vote for every £10 of stock held in the name of any employee, or jointly with his wife and children up to £100; 1 vote for every £25 above the first £100 up to £300; 1 vote for every £50 above the first £300 up to £1,000; above £1,000, no more votes, thus giving a maximum of 32 votes for each £1,000 holding; the object of this, as declared by Sir George Livesey, being to permit the choice to remain largely with the more thrifty and stable of the workmen. The Directors are elected by the year, one retiring each year.

The purpose of the plan of the South Metropolitan Gas Company has been eminently successful, as there are to day about £200,000 of the employees' money invested in the shares of the Company, representing nearly three-fourths of the total bonus which has been paid to the men during the period from the inauguration of the fund. It has taught men habits of saving who never saved before, and has cemented the relations between the employees interested and the corpo ration. At the same time, it has not limited the scale of wages, as the ruling scale of wages, based upon the general law of supply and demand in London, has been applied; the rate of wages and the hours of employment being on a par with others of similar employment where such profit-sharing plan is not in vogue.

A similar plan has been adopted by the Boston Consolidated Gas Company, going into effect September 20, 1906. The plan follows the lines of the South Metropolitan Gas Company, with some modifications. Premiums are to be calculated on the annual salaries of yearly earnings of the employees at the same rate as the dividends for that year on the stock of the Company. The first premium was to be at the rate of 7 per cent. per annum, the present dividend of the Company, with gas at 90 cents per 1,000 cubic feet. The detail of this plan is published in the issue of *Progressive Age* of October 15, 1906. Practically, in all respects, it is a copy of the plan, as stated above, of the South Metropolitan Gas Company, the principle of the London sliding scale, which has been adopted in Boston, being applied to the profits to be given to the employees.

Beneficial Societies.—As to the beneficial societies, or relief funds, we have considered more particularly the plan of the Pennsylvania Railroad Company, which, we understand, is the form adopted by other railroads, and which has been in existence since 1886. The purposes of the fund can be better explained by quoting from their own book on the description of their relief department, Section 2, which is as follows:

"The relief fund is a fund formed chiefly of regular monthly contributions by employees, who, while so contributing, are styled 'Members of the Relief Fund,' constituting a Mutual Beneficial Association. The fund also includes income or profits from investments, appropriations by the Company, and gifts of legacies for the use of the fund. From this common fund the members are entitled to receive definite amounts, proportioned to their contributions, when disabled by accident or sickness, and in the event of their death certain definite amounts are payable to their relatives or designated beneficiaries."

The advantages of the fund are of course obvious to everyone. The enrollment is voluntary among the employees, and any employee, if not over 45 years of age, may, on application, become a member upon passing a satisfactory physical examination. Wherever it is possible the men are induced to join the organization. The relief fund from which benefits are paid is composed of voluntary contributions from employees; appropriations by the Company to make up deficit, if such deficit occurs; income or profit derived from investment of the moneys of the fund, and such gifts or allowances as may be made to the fund. The Company agrees to take general charge of the voluntary relief department; to guarantee the fulfillment of the obligations assumed by the fund in conformity with the regulations from time to time established; take charge of the funds and be responsible for their safe keeping; supply the necessary facilities for conducting the business of the relief association, and to pay all the operating expenses thereof. There are 5 classes in the fund, which are divided according to the

amount of salary received, and the contributions per month vary with the salary, as follows:

	Per Month.
First class, any rate of pay	$ .75
Second class, those receiving $35 or more	1.50
Third " " " 55 "	2.25
Fourth " " " 75 "	3.00
Fifth " " " 95 "	3.75

These rates are not varied from, and there are no extra assessments on account of demands upon the fund. Any employee, not over 45 years of age, may enter or change to a class higher than that determined by his usual earnings, upon passing a satisfactory physical examination, if he shall have been a member of the relief fund 1 year and continuously in the service for 5 years, both immediately prior to the time of application to enter the higher class. The members are entitled to the following benefits:

Payments for each Day while Disabled by Accident in the Company's Service.

	For 52 Weeks.	After 52 Weeks.
First class	$ .50	$ .25
Second "	1.00	.50
Third "	1.50	.75
Fourth "	2.00	1.00
Fifth "	2.50	1.25

Payments while Disabled by Sickness or Injury other than Accident in the Company's Service, for each Day after the First 3 Days.

	For 52 Weeks.	After 52 Weeks.
First class	$ .40	$ .20
Second "	.80	.40
Third "	1.20	.60
Fourth "	1.60	.80
Fifth "	2.00	1.00

Payments in the Event of Death.

First class	$250
Second "	500
Third "	750
Fourth "	1,000
Fifth "	1,250

Any employee, upon passing a satisfactory physical examination, can take additional death benefits, as per the following table:

	Death Benefit of Class.	Additional Death Benefit.	Total Death Benefit.
First class	$250	$250	$500
Second "	500	500	1,000
Third "	750	750	1,500
Fourth "	1,000	1,000	2,000
Fifth "	1,250	1,250	2,500

For each additional death benefit of the first class, the rates are as follows:

Taken at not over 45 years of age.....30 cents per month.
" over 45 and not over 60 years.....45 " " "
" over 60 years.....60 " " "

This rate is not increased on account of increasing age. There are various details entering into the operation of this fund which your Committee will be very glad to give to any of the members who desire the information, the purpose of this report being merely to explain the method adopted by the railroad system for the beneficial association.

The fund is in charge of the superintendent, who is subject to the control of the general manager, and with his approval employs the medical and clerical force. The superintendent is under the control of the advisory committee, which committee consists of the general manager of the Company as member *ex officio* and chairman, and 14 members, 7 chosen by the Directors of the companies and 7 by the members of the relief fund, to serve for periods of 1, 2 and 3 years respectively, and thereafter for periods of 3 years each. The 7 committeemen, chosen by the members of the relief fund, are selected from the 7 different divisions of the Company, which divisions are included in the "Voluntary Relief Department," as their fund is called. It is the duty of the advisory committee to have general supervision of the operations of the department; arrange for investments of money not required to be kept on hand for current use; appoint persons to audit the condition of the fund each year; propose such amendments to or changes in the regulations as it may deem desirable; and act upon questions brought before it, by appeal from decisions of the superintendent or otherwise, respecting the rights and claims of members.

A particular and important feature in this fund for the benefit of the workmen was set forth in the statement made at Washington in regard to this department and the attitude of the Company toward it, the charge being made that the relief department was maintained in the interest of the Company and for the purpose of depriving members of their legal rights. We refer particularly to the guarantee of the fund by the railroad Company, and, to more thoroughly explain this, we will quote that report:

"In addition to these large contributions by the Companies, there is the absolute guarantee of the Companies that all just claims against the fund will be met when presented. This alone is a very valuable consideration, especially when considered in connection with the very small amount of cash on hand, equivalent to less than 1 per cent. of the risk of over $47,000,000 liability for death of members. This condition would be impossible with an ordinary co-operative beneficial organization, as the State insurance departments would not allow any organization of this character to continue with such a slender reserve fund. This guarantee is of incalculable value when considering the possible distress that would ensue in case of a serious epidemic, if it were not for the Companies' guarantee to make good any and all deficiencies, and can be better appreciated when one recalls the numerous failures of other mutual beneficial organizations to meet their obligations."

The value of this can be fully appreciated, as well as also the fact that every dollar contributed by the members is returned to them in benefits, and that every cent of expense, as stated in the early part of this report, for conducting the department, of any character whatever, is paid by the Companies.

We might also add in this connection that the records of the funds, as stated in the report mentioned, show that "The amount paid for accident, disablement and death from accident equals less than one-half of that paid for disablement and death from sickness."

We attach hereto a copy of the statement made by the officers of the Pennsylvania Railroad Company, covering their voluntary relief department, which was made at Washington during the consideration of the "Bates bill," at, we believe, the last session of Congress. This is a very interesting statement, and we shall be glad to furnish copies to any member of the Committee desiring it.

Superannuation Fund.—As to the superannuation fund, which is a part of this relief fund, it can be tersely summed up as follows:

The surplus accumulated as a result of the establishment of this fund is securely invested and the proceeds applied to what is termed the "Superannuation Fund." This fund applies to employees who have been retired on account of age from the Company's payroll, and is paid in addition to the pension (a short statement of which follows), which the Company pays out of its own treasury irrespective of the allowances from the fund.

The superannuation benefits are determined by multiplying the number of each class in which he shall have been a member by the number of full calendar months during which he has subscribed to each class respectively. The sum of the results thus obtained is the rate in cents of monthly allowances. It can readily be seen that this allowance is a very small one, comparatively. If a man has paid for 20 years in Class 1, he will receive an allowance of only $2.40 a month, and varying from that amount to $12 per month in the case of a man who subscribed for 20 years to the fund in the highest class.

Pension.—This pension is paid entirely by the Company and has nothing to do with the voluntary relief department. The pension is determined as follows:

An average is taken of the salary paid during the last 10 years of service. One per cent. of this average for each year in which the employee has been in the service of the Company constitutes the pension paid him until death.

Retirement upon pension becomes obligatory when an employee reaches 70 years of age, and pension is given to any one reaching that age, irrespective of term of service, and is determined as per above regulations. Any employee between the ages of 65 and 70, who has served 30 or more years, can apply for retirement and pension, which is granted if in the opinion of the employing officer he is incapacitated for further service.

We find in our examination of the subject that the South Metropoliton Gas Company, which is referred to in this report, has also a relief fund, practically the only difference being that in the event of death a further assessment is made upon each employee in the establishment or station in which the deceased member of the fund was employed.

Beneficial Association of the Philadelphia Electric Company.—It will probably be more interesting to the members of this Committee to relate the experiences gained in Philadelphia by the operation of a

beneficial association, as it applies directly to the class of corporations in which we are engaged. This Association has practically been in existence since 1887, and was originally started by the Brush Electric Light Company. Under this plan the assessment to be paid by each member was 1 per cent. of his regular monthly pay as rated, the Company contributing each year a sum equal to the aggregate of the sums contributed by the employees.

During the period of the existence of this Association the members and the Company have been thoroughly satisfied with the results, and in but few cases have any members of the Association or their families sued the Company for damages for accident or death.

This Association has been operated on limited lines, and at the end of the year 1906 the membership was but one-fourth of the employees of the Company. It is proposed to enlarge the Association to take in all the employees of every class of the Philadelphia Electric Company, and fix the amount that the Company is to contribute, the details of which will follow. With this in view, meetings have been held with the members of the existing Association, who have unanimously consented to the changes and are willing to join the enlarged Association. The object of the Association is the establishment and management of a fund, known as the "Beneficial Fund," and the payment of definite amounts to members of the Association who are entitled thereto by reason of disability from accident, sickness or other cause, and in the event of their death. The members shall be only employees of the Philadelphia Electric Company, or of its affiliated, controlled or leased Companies. Membership shall be forfeited upon a member leaving or being discharged from the service of the Company. Application for membership shall be in writing in the form which has been prepared, and which contains all the conditions of membership, a copy of which will be found in the regulations hereto attached.

Fees and Dues.—An initiation fee of $1 to accompany application. Each member whose monthly salary or wages shall amount to $100 or more shall pay the sum of 75 cents as semi-monthly dues; and each member whose monthly salary or wages shall be less than $100 shall pay semi-monthly dues equivalent to ¾ of 1 per cent. of his monthly salary. These dues shall be deducted or retained from the wages of the member by the Treasurer of the Philadelphia Electric Company, and shall be delivered semi-monthly to the Treasurer of the Association.

The Philadelphia Electric Company assumes all the expense of clerk hire, office room, and all charges for stationery, etc., and shall facilitate in every way, without any charge therefor, the investment and handling of the relief funds, from time to time, for the benefit of the Association. The Philadelphia Electric Company shall further contribute to the said fund to the extent of a sum equal to the amount from time to time contributed by the employee members of the Association, until the total sum contributed by the members and the Company shall aggregate the sum of $25,000, after which time the Philadelphia Electric Company shall contribute a sum equal to but 50 per cent. of the amount contributed by the members. After the accumulated fund shall amount to $50,000, the sum to be contributed by the Company shall be an amount equal to 10 per cent. of the sum contributed by the members, until such time as the accumulated fund shall amount to the sum of $100,000, after which time the Company shall make no contributions, except at such times as the fund shall fall below $100,000, and until the said fund again reaches $100,000.

Sick Benefits.—The benefits awarded each member of the Association during sickness, other than that resulting from accident, shall amount to a sum equal to ½ of his regular wages, for a period not exceeding 10 weeks. Sick benefits will not be paid for a less period than one full week, but will be paid for fractional parts of any week exceeding that period.

Accident Benefits.—The benefits awarded each member of the Association in case of accident shall amount to a sum equal to the full amount of his regular wages and for a period not exceeding 10 weeks, except in cases of serious injury, in which case the period of benefits may be extended by vote of a majority of the trustees present at regular meeting; benefits to commence upon the first day of disability upon which no wages are paid. In the event of any member of the Association in good standing becoming permanently disabled, the trustees shall, by unanimous vote of all the trustees, at a regular meeting of the board, draw an order upon the treasurer of the Association for a sum not exceeding the aggregate yearly wages of such member, such sum to be paid as soon as practicable after disability.

Death Benefits.—In the event of the death of any member, the treasurer of the Philadelphia Electric Company is authorized, at the request of the trustees, made through the superintendent, to deduct 50 cents from the wages of each member of the Association and pay the same to the treasurer of the Association, who shall in turn pay it to the beneficiaries named in the application of the member. If this assessment of 50 cents per member shall amount to a sum exceeding $500, the assessment *per capita* shall be reduced proportionately, so that the total amount collected by any one assessment shall not exceed $500. And the Philadelphia Electric Company will contribute a sum equal to one-half of the aggregate amount deducted from the wages of the members as above stated. If the deceased member shall have been an employee of the Company for 5 consecutive years, an additional sum of $250 shall be paid by the treasurer of the Association, in addition to the death assessment and the contribution of the Philadelphia Electric Company, It will be observed that this death benefit is an insurance of $750, and in the case of an employee in active service for 5 years, $1,000.

A part of the death benefit may be paid before the final settlement, to meet funeral and other urgent expenses, to an amount not exceeding $125.

Should a member, or his legal representative, or any other person authorized by law, bring suit against the Philadelphia Electric Company for damages on account of injury or death of such member, payment of benefits from the beneficial fund on account of same shall not be made until such suit is discontinued. If prosecuted to judgment or compromised, any payment of judgment or amount in compromise shall preclude any claim upon the Association for such injury or death.

The officers of the Association shall be a superintendent, a treasurer and a secretary, who shall be appointed annually by the president of the Company. There shall also be a board of 8 trustees, employees of the Company, who shall be chosen by ballot at the annual meeting of the Association. Members of the board of trustees to serve during the first year shall be chosen by the President of the Company, and in case of vacancies thereafter during the year they shall be filled by the superintendent of the Association, and serve until their successors are duly chosen. For the information of the Committee, a copy of the Regulations, which are now in general operation in Philadelphia, is attached hereto.

United Traction Employees' Mutual Aid Association, Providence, R. I.—This Association was formed by the United Traction and Electric Company for the employees of companies owned, operated or controlled by it, for the purpose of affording aid and relief to sick and disabled members, and to the widows and children of deceased members. All employees making weekly contributions are members of this Association; elective officers and temporary laborers on construction work are excluded.

The management of this Association is vested in 7 persons; 4 chosen by the directors and 3 by the members from their own number by ballot. Each member is entitled to 1 vote, with his name indorsed thereon, and the members having the largest number are declared elected. If a vacancy exists in the number of trustees chosen by the Directors, said vacancy is filled by the remaining trustees chosen by the Directors; but if a vacancy occurs in the trustees chosen by the members, the remaining member trustees fill the vacancy. The organization is managed by a chairman, treasurer, secretary, and any additional officers at the pleasure of the board. The members are divided into three classes, for the purpose of determining benefits and contributions.

First Class.—All members whose weekly earnings are less than $9.

Second Class.—All members whose weekly earnings are $9 or more, but not so much as $12.

Third Class.—All members whose weekly earnings are $12 or more.

The first class contributes 10 cents each week; the second class contributes 15 cents each week; the third class contributes 20 cents each week; such contributions continue whether the member is working or on the sick or accident list.

Benefits at Death.

First class	$500
Second class	750
Third class	1,000

One-half of the said amount is paid to the widow or husband; the other half to the children. If no children, then the whole goes to widow or husband. If no widow or husband, then to the next of kin according to law. Proviso is made that if the beneficiary is in receipt of a pension from any of the companies he can not participate in the death benefits, except the widow or husband of a member. The usual exceptions are also made that no benefits shall accrue to any person

if any member's death is due wholly or in part, directly or indirectly, to the use of alcoholic liquors; the immoderate use of stimulants; violence, and so forth, or resulting from voluntary and unnecessary exposure to danger of injury, contagion or infection, unless in pursuance of duty as an employee. An exception is made to this in the matter of self-defense.

Benefits in Case of Disability.

First class	$4 per week.
Second class	6 " "
Third class	8 " "

Provision is made that, if the total benefit insurance of any member exceeds his average weekly wages, then the amount received from this Association is proportional as his weekly wages bear to his benefit insurance. No benefits are paid for disability arising from any of the causes specified in Section 3, and partly enumerated above. Members receive benefits for disability as long as it continues, or until such time as they become entitled to a pension.

Releases.—In consideration of the contributions to be made to the funds by the Company, there is no benefit paid either for death or disability except upon a receipt which contains a release in proper form to the said United Traction and Electric Company and the companies owned, operated or controlled by it. If any member, or any beneficiary of a member, shall make claim or bring suit against the Company, or any company owned, operated or controlled, he shall not be entitled to any benefits from the Association, unless the claim is abandoned and withdrawn, or such suit is discontinued without trial. Any payment, compromise or settlement of any claim, or of any judgment under such suit, cancels and nullifies all the rights of such member or beneficiary to any benefits from this Association.

Proofs of Death or Disability.—Proofs of death or disability must be furnished within 30 days after death or after the commencement of such disability, and the benefits accrue from the date of notice only. The members must permit a physician or physicians selected by the Association to examine them, and a refusal forfeits the right to further benefits until such examination is permitted. A majority of the trustees rule on all matters of every kind and nature presented to them, and the members have the right of appeal to the said Board from decisions given by any person or persons to whom power may be delegated.

Application of Surplus Funds.—The Board can apply any surplus funds in any one or more of the following ways:

1. To pay partial benefits for partial disability.
2. To increase the benefits for death or disability or both.
3. To diminish the contributions of the members, ratably.

Forfeiture of Membership and Benefits.—By virtue of the contract between the Association and the United Traction and Electric Company and the Rhode Island Company, by virtue of its assumption of the traction contract, it is expressly declared that any member who shall cease from any cause to be an employee of said Company or Companies, or some of them, shall thereupon cease to be a member of this Association, and that he and each and every one of his beneficiaries shall thereupon forfeit all right, title and interest he or they had in or to funds held by the Association. There is a proviso that temporary suspension, or absence from duty on leave, shall not be construed as a termination of a member's employment. The contract between the Company and the Association is attached hereto, marked "Exhibit D."

The salient features of this contract are that the Company agrees to contribute to the funds of the Association, as follows, viz.:

(1) In the case of death:

First class	$100
Second class	150
Third class	200

(2) One-fourth of the amount of contributions by the members, payable weekly as the said amount may be determined.

(3) Amounts, from time to time, sufficient to meet the current expenses of management, including expenses of adjusting and litigating claims.

(4) Amounts to make up any deficiencies, provided that such contributions for any such deficiencies shall be repaid out of any surplus that may thereafter be accumulated. The Traction Company deducts the contributions of the men from their wages.

It will be interesting to note some of the data gathered from the report of this Association for the year 1906:

The disability claims paid amounted to	$22,676.45
The death " " "	10,625.00

Of which the members bontributed only $14,690.95, and the Company $19,272.75. Since the organization, death claims have been paid amounting to $47,250, and disability claims, $89,363.89, of which the members contributed $75,675.25 and the Company $62,118.85. The entire expenses of the management having been met by the Company, said expenses do not appear in their report, and are in addition to the amounts noted above. It is noted in said report that the larger part of the disability benefits have been for short illnesses; but, from the few cases of long disablements, it is a pleasure to note that the benefits received are supporting the disabled members decently, though economically, at a sanatorium, and affording them every chance for recovery.

Pension System.—As an adjunct to the above Association, but dissociated from it, is a pension system paid entirely by the Railroad Company, the salient points of which are as follows: Every employee reaching the age of 70 years must retire from service, and he will receive a pension according to time of service, as follows, viz.: For less than 20 years, 1 per cent. of his average wages for the 10 years immediately preceding, for each year; thus, a man earning $600 per year, who had been in the employ of the Company for 19 years, would be entitled to a yearly pension of $114.

For 20 years and up to 25 years					...1.25	per cent.	per year.
" 25	"	"	"	30	" 1.50	"	"
" 30	"	"	"	35	" 1.75	"	"
" 35	"	.....			..2	"	"
" each year above 35 years					2	per cent. per year, but not to exceed 100 per cent. in all.	

No one is employed over 35 years of age. Each applicant must submit to a physical examination, for which he must pay the physician's fee of $1, which he forfeits whether accepted for service or not. On the inauguration of the system all employees were eligible to membership in the Association, without regard to physical condition.

Results of the Operation of an Employees' Association of a Large Public Utility Corporation, Including Results of Mortuary and Sick Benefit Funds.

MORTUARY FUND.

Balance, January 1	$3,788.40	$6,024.37
Receipts.		
Dues, etc., to December 31	$6,561.00	$6,817.00
Members' receipt books	.20	.10
—— Co., contribution	3,162.50	3,360.25
—— Co., medical examiner's car fare	19.25	.....
—— Co., interest on investment	1,049.10	1,260.62
—— Trust Co., interest	76.18	73.05
	$14,656.63	$17,535.99
Disbursements.		
Death benefits paid (21), (23)	$6,300.00	$6,900.00
Refunded dues, members leaving companies' employ	259.50	355.00
Salaries—secretary, treasurer and porter	100.00	134.00
Financial secretary's refunded dues	120.00	127.00
—— Co., for investment	1,500.00	4,506.25
Financial secretary, expenses, car fare, rent, printing, postage bonding, officers financial secretaries, etc	154.51	117.62
Medical examiner's fees, etc	198.25	111.00
Balance, December 31	6,024.37	5,285.12
	$14,656.63	$17,535.99

FRIENDLY AID FUND.

Balance, January 1	$3,417.24	$1,473.17
Receipts.		
Dues, etc., to December 31	$2,987.60	$3,564.30
—— Co., contribution	1,374.30	1,724.00
—— Co., medical examiner's salary and car fare	122.80	1,994.55
—— Co., interest	106.04	116.79
—— Co., overpayment account investment	165.00	.....
Sick benefits, overpayment	7.00	.....
—— Trust Co., interest	30.84	22.15
	$8,210.82	$8,894.92
Disbursements.		
Sick benefits paid (474), (633)	$3,083.00	$4 338.00
Refunded dues, members leaving companies' employ	334.40	429.60
—— Co., for investment	2,500.00	.....
Medical examiner's salary	175.00	1,790.00
" " "	.....	213.00
Salaries—secretary, treasurer and porter	100.00	134.00
Financial secretary's refunded dues	72.00	76.20
Medical and surgical supplies	296.13	332.36
Medical examiner's car fare	33.80	79.55

Financial secretary, expenses, car fare, rent, printing, postage, bonding, officers, financial secretary, etc	$143.32	$209.05
Balance, December 31	1,473.17	2,263.19
	$8,210.82	$8,894.92

Relief Fund.

Balance, January 1, 1906		$745.50
Receipts.		
Entertainment, December 15, 1905 (expenses ded.)		412.00
" " 14, 1906 (to date)		1,074.00
Account loans		30.00
—— Trust Co.		26.82
		$2,288.32
Disbursements.		
T. McD., relief	$15.00	
Expense, account entertainment, December 15, 1905	8.00	
P. K., relief	6.00	
T. McD., relief	12.00	
M. S., relief	6.00	
Expense, deposit account hall for December 14, 1906	25.00	
W. B., relief	5.00	
Expense, account entertainment, December 14, 1906	4.00	
Loan, L. R. W., at 5 per cent	125.00	
Loan, J. F. K., at 5 per cent	150.00	
J. J., relief	30.00	
P. K., relief	12.00	
Expense, account entertainment, December 14, 1906	657.60	
		$1,055.00
Balance, December 31, 1906		$1,232.72

Summary of Disbursements.

Account relief	$86.00	
Loans	275.00	
Expenses, account entertainment	694.60	
Total		$1,055.60

Summary of Cash.

Mortuary Fund:	1905.		1906.	
Amount invested with—— Co., at five per cent.	$21,119.58		$25,625.83	
Cash on hand, —— Trust Co.	6,024.37		5,285.12	
		$27,143.95		$30,910.95
Friendly Aid Fund:				
Amount invested with—— Co., at five per cent.	$2,335.00		$2,335.00	
Cash on hand —— Trust Co.	1,473.17		1,293.16	
		$3,808.17		$3,628.16
Total, Mortuary and Friendly Aid Funds		$30,952.12		*$34,539.11
Relief Fund:				
Cash on hand —— Trust Co.		745.50		1,232.72
Total in three (3) funds.		$31,697.62		$35,771.83

* The increase during the year is $1,4[illegible]6.26 less than the amount contributed by the ——Co. durtng the year 1906 ($5,[illegible]84.2[illegible], not including interest, $1,377.37; and medical examiner's salary and car fare, $1,[illegible]94.55).

This proves that more money is being expended than the members are contributing, and if it were not for the generosity of the —— Co. we would show at the end of the year a deficit instead of an increase.

Summary of Death Benefits Paid—1891-1906.

1891	2 deaths		$600.00
1892	13	"	3,900.00
1893	9	"	2,700.00
1894	15	"	4,500.00
1895	12	"	3,456.20
1896	13	"	4,043.80
1897	18	"	5,400.00
1898	13	"	3,900.00
1899	19	"	5,700.00
1900	18	"	5,400.00
1901	20	"	6,000.00
1902	18	"	5,400.00
1903	19	"	5,700.00
1904	26	"	7,800.00
1905	21	"	6,300.00
1906	23	"	6,900.00
Total	259 deaths	Total	$77,700.00

Average deaths, first five years		10¼
" " second " "		14½
" " third " "		20¾
" " last six " "		21½
Average deaths per year		16 7/12

During the year 25 deaths were reported, of which 23 have been promptly paid. Two deaths remain unpaid; papers were not received in time to pay these deaths in 1906, but since January 1, papers have been received and the claims are in due course of payment. Of the 23 deaths paid, 19 are what we call original members; that is, members who have joined the society between February, 1901, and February, 1902, leaving 4 deaths among those members who underwent a medical examination (and were admitted to membership on such examination) since the revision of the constitution and by-laws in 1902. Since 1902, 107 members have died, 5 having been admitted upon the result of the medical examination and 102 as original members.

The beneficiaries of these deceased (23) members received $6,900, and the total amount paid by these members was $1,563, or 22.65 per cent. of the benefits received. The average payment by these members was $67.93. The largest amount paid by a deceased member was $95, or 31.23 per cent. of one benefit; and the amount paid to the beneficiary for each $1 paid by this member was $3,154. The smallest amount contributed by a deceased member was $14.50, or 4.5 per cent. of one benefit; and the amount paid the beneficiary for each $1 paid by this member was $20.69, or 7.14 per cent. of one benefit. The average return for each $1 contributed by deceased members was $4.41. The longest duration of membership of these deceased members was 14 years and 10 months. The shortest duration of membership of these deceased members was 2 years and 5 months.

In 1902 the —— Company began its contributions to the society, and since February, 1902, it has contributed to the—

Mortuary Fund	$15,558.00
Friendly Aid Fund	5,828.10
Medical examiners' salary	7,365.00
Medical examiners' car fare	174 25
	$28,925.35

On investments the Company paid the society 5 per cent. interest, which amounted to $4,793.99; this amount, added to the $28,925.35, makes a total of $33,719.34. The interest the society would have received from other sources of investment, such as depositing its surplus funds in savings banks (its old method of investment), would have been from 3 to 3.5 per cent., so by investing its surplus funds with the Company the society gains from 1.5 to 2 per cent. on its investments.

Amount of Sick Benefits Paid.—1905-1906.

	1905.	1906.	Increase.	Decrease.
January	$233	$370	$137	..
February	368	416	48	..
March	278	350	72	..
April	300	414	114	..
May	186	270	84	..
June	207	276	69	..
July	180	349	169	..
August	201	338	137	..
September	185	148	....	$37
October	199	509	310	..
November	315	437	122	..
December	431	461	30	..
Total	$3,083	$4,338	$1,255	..

Average benefits paid per month during 1905	$256.92
" " " " " 1906	361.50
" increase per month, 1906 over 1905	104.58

Amount of Sick Benefits—1902-1906.

1902	21 benefits		$216
1903	205	"	1,601
1904	369	"	2,597
1905	474	"	3,083
1906	683	"	4,338
Total	1,752 benefits		$11,835

Total Attendance—Medical Examiners.

	Medical.	Surgical.	Total.	Estimated Financial Saving to Sick Members.
1902	200	121	321	$800
1903	660	271	931	2,500
1904	1,009	448	1,457	3,500
1905	1,066	501	1,567	4,000
Dr.	1,740	548	2,288	6,000
1906 Dr.	130	83	213	650
	4,805	1,972	6,777	$17,450

This amount of estimated financial saving to sick members, $17,450, and the amounts $11,835 and $894.03 (sick benefits, medical and surgical supplies) expended since 1902, show a total of $30,179.03. As we have an arrangement whereby we pay only 25 cents per prescription and the medical examiners allow the society the regular discount on all surgical supplies, this amount paid by the society for medicines,

List of Deceased Members—1906.

Book No.	Admitted.	Age.	Date of Death.	Age.	Cause of Death.	Amount of Dues Paid.
1,861	April 10, 1903	34	Dec. 31, 1905	36	Pulmonary tuberculosis	$16.50
78	Feb. 17, 1891	34	Jan. 5, 1906	49	Cholæmia, cirrhosis of the liver, complicated with ascitis, hydrothorax and jaundice	90.00
1,854	Feb. 19, 1903	32	Jan. 9, 1906	36	Pulmonary tuberculosis	18.00
256	Feb. 17, 1891	41	July 5, 1905	56	Syncope and nephritis	87.00
560	July 10, 1891	66	Feb. 19, 1906	81	Exhaustion, siguela or gangrene of feet	88.99
142	Feb. 17, 1891	50	Feb. 10, 1906	65	Arterial schescim and chronic endocarditis	90.50
718	April 20, 1893	47	Feb. 21, 1906	60	Pneumonia	65.50
554	May 21, 1891	55	May 14, 1906	70	Fractured skull	90.00
1,554	Oct. 18, 1900	46	April 1, 1906	52	Heart disease	33.50
1,040	June 20, 1895	26	May 31, 1906	37	Tuberculosis	50.00
305	Feb. 17, 1891	47	May 30, 1906	62	Carcinoma of liver	92.00
846	Jan. 18, 1894	44	June 20, 1906	66	Pulmonary œdema and valvular disease of the heart	63.00
621	June 10, 1892	38	July 11, 1906	52	Acute articular rheumatism and endocarditis	85.00
819	Oct. 19, 1893	29	July 23, 1906	42	Cancer of stomach	65.00
1,683	Aug. 15, 1901	39	July 29, 1906	43	Asphyxia, aneurism arc of aorta	30.00
238	Feb. 17, 1891	25	Aug. 22, 1906	40	Pneumonia with typhoid fever	93.50
428	Feb. 17, 1891	59	Aug. 2, 1906	74	Mitral insufficiency	93.50
1,941	Jan. 16, 1904	32	Oct. 10, 1906	32	Lobar pneumonia	14.60
201	Feb. 17, 1891	41	Nov. 1, 1906	56	Chronic endocarditis and nephritis	95.00
70	Feb. 17, 1891	55	Nov. 7, 1906	69	Hypostatic pneumonia	95.00
943	Aug. 16, 1894	36	Nov. 14, 1906	49	Chronic endocarditis and chronic nephritis	74.00
603	March 17. 1892	48	Nov. 19, 1906	62	Chronic nephritis	88.50
1,764	March 20, 1902	45	Dec. 24, 1906	49	Pleuro-pneumonia	29.00
						$1,563.00

Average age at date of admission, 42 3/23 years. Average age at date of death, 53 11/23 years.

and so forth, should be increased 100 per cent. and it would still be a fair estimate of the amount the members would have to pay for medical and surgical supplies. This amount would then be $31,073.06.

The total membership of the Friendly Aid Fund during this period, 1902-1906, has contributed in dues, and so-forth, $12,683.53. This shows a fair estimate saving of $18,389.53 (to sick members) on the total membership's contribution. Thus far only (about) one-third of the membership of the Friendly Aid Fund have derived the benefits of this fund. Should this seem unfair to those remaining members who have had as yet no occasion to resort to these advantages, let them consider that, should the need arise, they also will receive the same benefits.

The following figures will show approximately the cost per visit of our medical examiner since 1902:

Total visits, 6,777.

Sick benefits	$11,835.00	
Medical examiners	7,365.00	
" "	213.00	
Medical and surgical supplies	894.03	
Car-fare medical examiners	174.25	
*Sundry expenses	1,000.00	
	$21,481.28	Per visit $3.1706
Including refunded dues	1,283.20	
	$22,764.48	" " 3.591
Sick benefits, medical examiner's supplies and car-fare	20,481.28	" " 3.0222

* Year 1902-4—taken from the expense fund, since abolished.

Total Amount of Dues Refunded to Members Leaving the Companies' Employ—1902-06.

	Mortuary.	Friendly Aid.	Total.
1902	$18.00	$24.00	$42.00
1903	137.00	167.10	304.10
1904	169.00	328.10	497.10
1905	259.50	334.40	593.90
1906	355.00	429.60	784.60
Total	$938.50	$1,283.20	$2,221.70

Sick Benefits Paid Since 1902.

1902-5	$7,497.00
1906	4,338.00
	$11,835.00

Cost Per Member—Friendly Aid Fund, Year 1906.

	Total Cost.	Cost per Member.
Sick benefits paid	$4,338.00	$4.6002
Printing, postage, car-fare, etc	209.05	.2217
Physicians	1,878.00	1.9915
Medical and surgical supplies	332.36	.3524
Car-fares of physicians	79.55	.0843
Refunded dues, members leaving companies' employ	429.60	.4556
Refunded dues, financial secretaries	76.20	.0808
Salaries, secretary, treasurer and porter	134.00	.1421
	$7,476.76	$7.9286
Dues per member		$3.6000
——Co., contribution (one-half)		1.8000
——Co., salaries of physicians		1.7656
——Co., car-fares		.0843
——Co., interest		.1473
New members		.0970
Total		$7.4942
Deficit		.4344
Average membership	943	
Membership end of 1906—Mortuary Fund	1,102	
" " " " Friendly Aid Fund	955	

[To be Continued.]

Lighting of Dark Places in Commercial Houses.

[Prepared for the JOURNAL, by "ENGINEER."]

The cost of space in all commercial centers makes it necessary for merchants to utilize every available inch of room to the best advantage, but this cannot be done in many instances because of lack of proper light. There are spaces beneath the sidewalk and in the basement of all stores and mercantile establishments which might be used if light were furnished, wherefore in recent years there has been a demand upon lighting engineers and contractors to install lighting facilities for illuminating underground apartments, storehouses, etc. The writer recently conversed with certain gas and electrical lighting engineers who make a business of seeking out dark rooms in buildings for the purpose of putting in an estimate for the lighting of the same, thereby giving the owners an opportunity of acquiring another apartment with only the additional expense of lighting it. To the contrary, the owners of the building apply to the engineering contractors for facilities for lighting such-and-such places. The gas lighting man is liable to have an application from some of the store people or manufacturers at any time to light up theretofore dark places, and the advent of modern lighting apparatus has made all this possible. Often you will find the gas arc employed in what were formerly dismal sections. Indeed it is not wide of the truth to say that gloomy corners, where the mould accumulated and bats thrived, are now brilliantly lighted, and busy workmen are able to use much of the space where only empty boxes and jetsam articles were stored. The demand for the illumination of space below the sidewalks of buildings is great. Fig. 1 is a sketch showing a sectional view of a sidewalk room below the walk, and in front of a commercial house. Above is the line of the show window. The lamp is supported by metal brackets in the usual way at *A*, and the piping for conveying the gas is stretched from the source of supply in the interior of the building to the illumined point in the room below the walk. There is a work bench, and around is ample space for a number of persons to work. It is a cool place in summer and a moderately warm one in winter, and as the spot is away from the buzz and noise of the business section, the workers toil in peace. S› here is seen room gained by the adoption of lighting apparatus. Again, a demand for lighting devices for employment by inspectors of large pipes exists. Sewerage pipes of great size have to be repaired. Often the pipe

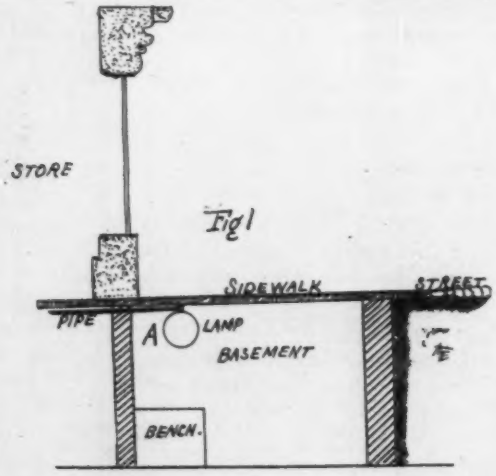

Fig 1

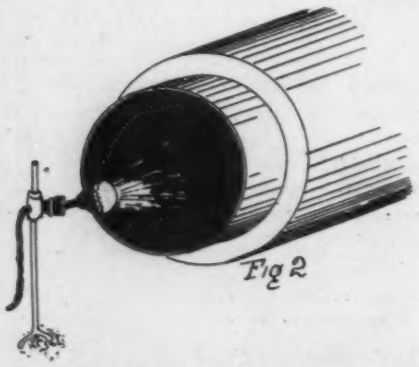
Fig 2

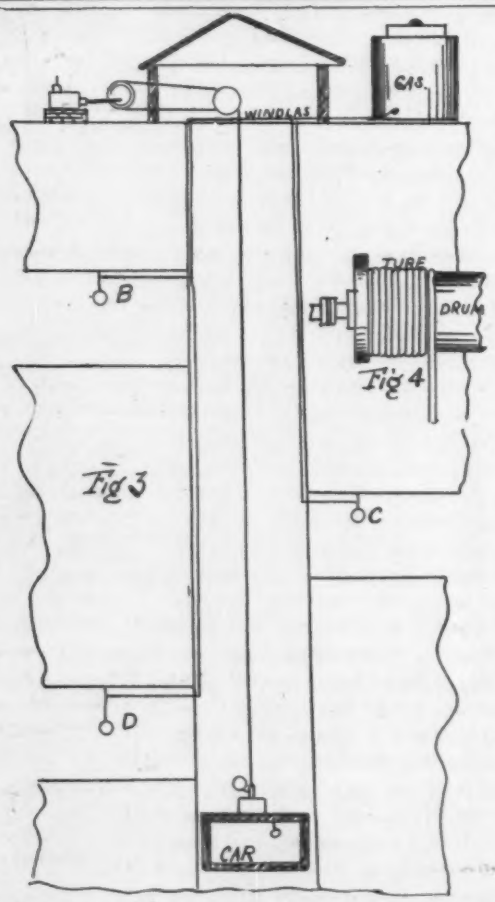

Fig 3

Fig 4

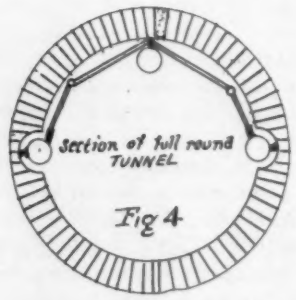

Fig 4

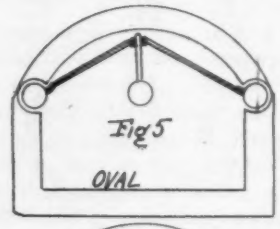

Fig 5

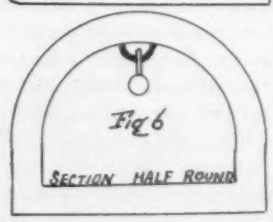

Fig 6

joints are installed in the gloom, where artificial light is needed. In such cases the lamp is adjusted to a stand, being employed as in Fig. 2. Portable hose or metal pipes for conveying the gas are common now and can be used with safety. The improvements along this line the past few years have been numerous.

Not long since I spoke with a party who had recently installed a number of gas arcs for tunnelling purposes in a mine. The arrangement of the lights in the various levels of shafts is explained in the cross-sectional drawing, Fig. 3. This represents the depth of the central shaft extending into the earth. There is an elevator car, and this, too, is provided with a gas arc, the conveying pipe line being carried up and down with the car, while the surplus is taken up in a coil at the top, the coil unwinding to drop off the pipe. The plan is shown in Fig. 4. The coil is formed on the drum, which latter is wood, and turns in bearings. It unwinds and lets off the pipe as the elevator car descends. A spring arrangement causes the drum to rewind the coil of pipe as the elevator car ascends. The pipe takes its gas from the generator through the hollow central shaft, which is furnished with a revolving ball-coupling.

Referring again to Fig. 3, it will be noticed that the three cuts of shafts at the three levels each have a lamp, these latter being designated *B*, *C* and *D*. The supply of gas is taken to these lamps through pipes running along the walls.

The problem of lighting shafts and cuts of mines in this way is not considered a complicated piece of work by gas arc light engineers. In fact, quite a number of engineers have worked out successful lighting plans along this line.

Attention is next called to some of the directly lighted masonry tunnels in which gas arcs are being used in the present age. The full, round tunnel is shown in Fig. 4; these tunnels are made in various sizes and for a multiple of purposes. Sometimes they are for a line of car tracks, often for carrying volumes of water, which water level does not exceed the level of the lower half, and, therefore, does not reach the lamps. In great cities where ponderous sewerage is needed, often these outlets are of huge size and carry the slush along the base, while the upper portion can be lighted for purposes of inspecting, cleaning and repairing. The plan of the lamps, as inserted in wall pockets, is shown. Fig. 5 shows the oval-top style, and Fig. 6 the half-round pattern.

The Illuminating Engineer.

The *Journal of Gas Lighting* notes that the members of the Society of Engineers in Charge, at a recent meeting were treated by Mr. Leon Gaster with an exposition of his views on the "Province of the Illuminating Engineer;" and at the conclusion of the paper, a full discussion ensued, which indicated that those present were by no means unanimous in their opinions as to the need for such a "new profession" as was referred to.

The paper was a lengthy one; and, of course, it contained much allusion to what has lately been accomplished in the United States in connection with the subject. The object with which it was written was to point out the means by which the existing state of affairs in the matter of securing proper illumination might be improved upon, and to indicate some of the important problems with which the Illuminating Engineer has to deal, and from the proper solution of which, it was urged, the consumer and the whole lighting industry would benefit in the future. The difference between light and illumination, said the author, might be defined—light was the cause, and illumination was the effect. An object on which light fell became illuminated; and an object was well illuminated when it could be easily seen without any fatigue or strain on the eyes. There was, however, the æsthetic aspect to be considered, with which the architect was very closely concerned, and which in many cases had not received the attention it deserved. The intentions of the architect were frequently defeated by the adoption of some tasteless and defective system of illumination, which quite failed to bring out to the best advantage the æsthetic and architectural features of a room or building. The enormous improvements made of recent years with different illuminants had rendered the proper application of the necessary principles somewhat taxing to the ordinary lighting contractor; and therefore much discussion had taken place with regard to the advisability of establishing a new specialist, to be called the Illuminating Engineer. It had been stated that the Illuminating Engineer would have to be a person of strong will and even temper, and would have to deal with gas, electricity, oil, acetylene, etc., and know how to make the best use of any or all of them. But even these qualifications did not constitute all that was required of him. He must possess a sound grounding in physics and chemistry, and some knowledge of physiological optics; he must be well up in the science and art of photometry; and, above all, he must have a lively sense of the artistic. He would have to be possessed of great tact and enormous persuasive powers, to wean people from such choice as an artistic but foolish fitting. In other words, the task of the Illuminating Engineer was not to be passed over lightly, and the numerous qualifications required would make it somewhat difficult to obtain satisfactory references if asked for.

The author remarked that the illumination of a room might be divided into two factors—that derived from the direct radiation from the source of light, and the diffused light resulting from the combined reflection from the surrounding surfaces, which varied very considerably; and he quoted the results of tests made by Dr. Louis Bell, of Boston, to determine the co-efficients of diffused reflection, obtained by using wall papers of different finishes and various colors. These showed that the co-efficients for sky light varied from 0.56 in the cases of deep cream stripes and deep cream silvery stripes, to 0.05 in those of deep green *crêpe* and deep red *crêpe*. He also quoted tables by Mr.

G. H. Stickney, of New York, showing the effect which certain colored rays produced when falling upon different colored objects, and the predominating colors of many artificial lights. After citing as one of the most curious instances of an "innocent misconception of the nature of reflected images" a patent granted about a 100 years ago for increasing the light of a gas jet by placing round it a number of glass bottles filled with water, Mr. Gaster said the idea that light could be increased by reflection was one of the most persistent fallacies of the whole question; and devices were by no means unknown to the trade to-day which in reality were based on this principle. It might be put down as an established fact that all modern light sources were too bright to be used uncovered; and when the light was to be employed for careful vision—such as reading or writing - it should either be inclosed in some sort of globe which would produce a diffused light, or be placed so that the eye could not see the source of it. If this rule were adhered to, it would be found that none of the modern high power lights were too hard on the eyes. The holophane globes, he remarked, had been invented with a view to avoiding serious waste of light; being arranged to diffuse the light, and at the same time turn the rays into a useful direction.

The author then made a few remarks upon factory, shop window and library lighting. Pointing out the false economy of requiring people to work by poor illumination, he said the personal inconvenience meant a reduction both in the quality and the quantity of the output—thus producing a loss to which, in comparison, the entire cost of illumination was trifling. The maintenance of the lighting system should not be left to the individual workman; the expense of the necessary lamps, to be regularly inspected, cleaned and kept in order would be a mere trifle compared with the loss of time of the higher paid labor of the operatives in keeping it in order, or the loss of efficiency in the same operatives due to neglect to properly maintain the system. As to shop window lighting, there was, perhaps, no other case in which light was so ineffectively squandered. Brilliant lights were frequently distributed either in the front of the window or among the contents of it, in such a way that the prospective customer could not gaze into the window without discomfort. Everyone had experienced the temporary blindness which followed an attempt to look steadily at an intensely bright object, and had noticed how impossible it was to see into a background behind a light of this description. This illumination seemed to have arisen through a confusion between two separate and distinct objects—first, to attract the attention of the purchaser; and, secondly, to exhibit the contents of the shop window to him when he had been attracted. If intense brilliancy was to serve as an attraction, the light should be arranged so as to be only visible to the destined customer, and not to obstruct his view of the window. Then with reference to libraries, the lights were often so placed as to brilliantly illuminate the gangway, while the lighting of the reading tables was less than insufficient. In a library, light should serve three chief purposes—it should enable the worker to read, it should illuminate the shelves of books so that the titles were easily recognizable, and it should illuminate the surroundings with a subdued, but sufficient, light. In improving these matters, the Illuminating Engineer could do much useful work.

The question of the proper placing of lamps, and the designing of entire illuminating schemes, might not, Mr. Gaster went on to say, be a very difficult task for those who had devoted attention to the subject; but when one bore in mind the fact that the requirements for proper illumination were not only concerned with efficiency as regarded current or gas consumption, but with the physiological and æsthetic effects produced, the problem became a little more complicated. In settling satisfactorily all these questions, the work of the Illuminating Engineer would be very valuable. It was not meant that he would be called in as a specialist for every little lighting installation; but his services would be important in assisting the architect and the consumer, not only in the selection of the proper type of lamp to be used, but in advising impartially as to the most suitable method of illumination to be adopted. In many cases gas and electricity were used side by side, each in its proper place, giving the consumer the best possible result under the circumstances. It was useless to deny that this new specialist, if he had made a thorough study of the different illuminants, and was not identified with any one of them, or connected with the sale of accessories applied thereto, would be a very welcome element, acting as a connecting-link between the architect, contractor, central station engineer and consumer. The Illuminating Engineer ought to be responsible to the consumer for the ultimate results obtained in the scheme of illuminati on adopted at his recommendation. The consumer had a right to see that he obtained value for his money; and as illumination was an absolute necessity, the question under consideration was how to determine the correct quantity and quality required for different purposes. Who was to do this?

Touching upon another point, the author quoted a remark made by Mr. E. L. Elliott in the *Illuminating Engineer*, to the effect that the purchasing and selling of light had from the beginning presented a curious anomaly of commerce. Its correlative money value had never been based upon a measurement of the thing itself, but upon the measurement of the commodity from which the light was produced. The two important steps, he said, intervening between the delivery of the illuminant and the production of illumination had been neglected. The whole question reduced itself to the one simple proposition: Can illumination be measured with sufficient accuracy, and with sufficiently simple apparatus, to make it a practical basis for money value? He believed that the present state of the science and art of illuminating justified an encouraging reply. The technical side of the question had been receiving a great deal of attention during the past year; and a number of new illuminometers had already been brought out, with a promise of others in the near future. Assuming that they had an instrument by which illumination could be measured at any given point, and on a plane in any position, what measurement should be taken as a basis of the payment for illumination? This was a matter which the Illuminating Engineer would have to decide. In 1892, Mr. A. P. Trotter, in a paper read before the Institution of Civil Engineers, said the study of light belonged to the science of optics, but very little information was available on matters of illumination; and he urged that when illumination was required, it ought to be possible to express intelligibly how much was wanted, and if a specification was given it ought to be known how to execute it. This suggestion had not before been put into general practice, not only because there were no satisfactory illuminometers manufactured, but because there were no authorities who could state definitely the amount of illumination required for different purposes. How would the data which were most essential for their guidance ever be obtained? Mr. Gaster's reply to his own question was: By securing a freer exchange of opinion and a friendly intercourse between the gas and the electric lighting engineers. In conclusion, he pointed out what had recently been done in America in the way of forming an Illuminating Engineering Society (which has already over a thousand members). A bureau, he said, composed of expert gas, electric and oil lighting engineers, architects, physiologists and opticians had been established in the States; and it was expected that the advice obtained from such a bureau of independent and impartial experts could only be of the greatest assistance in guiding them in the future towards betterment of illumination, and towards beautifying their homes, public buildings, parks and streets. That there was ample need of reform in the general practice of illumination, both professionals and laymen must agree.

In opening the discussion, Mr. A. P. Trotter (the Chairman for the evening) remarked that certainly Mr. Gaster was an enthusiast; and he had called attention to an extraordinary state of things in gas, electric, and other kinds of lighting. They did not want to know about lamps and candle power, but about the resulting illumination. There had been a very great lack of measurement. More than a quarter-of-a-century ago, Sir William Preece and he had turned their attention to the subject; and at that date Sir William had invented an illumination photometer. But this was too soon. Now, however, the question was coming forward again. It was important to treat the matter from a good, common-sense point of view. It was very attractive to the mathematician; and they heard of mean spherical candle powers, and all that sort of thing. But in reality it was a simple problem, which seemed well worthy of the attention of almost all branches of engineering.

Mr. C. W. Hastings sympathized with what had been said as to the necessity of the Illuminating Engineer. There was great difficulty in getting a class of men who knew anything about illumination. It was only in the last 4 or 5 years that gentlemen had been brought to the front who could instruct the consumer as to the lighting of his premises. Recently rapid strides had been made in gas lighting; and now with the inverted burner it was possible to obtain as brilliant an illumination as with electricity at a very much lower cost. One who had taken a great interest in the subject was Mr. W. R. Herring, of Edinburgh, where the quantity of gas that the authorities allowed to be used in the lamps was for many years 2 cubic feet per hour for a flat flame burner. For several years before the inverted burner came out, he tried to introduce the upright

Welsbach; but he was not successful, because they tied him down to the quantity of gas named. But ultimately he introduced the inverted burner, and succeeded in getting an illumination of something like 30 candles per cubic foot with a consumption of 2½ cubic feet per hour, or a total of about 70 candles, as compared with the old flat flame, which gave an illumination of 7 candles with a consumption of 2 cubic feet. He was not, however, there to defend gas, but to speak strongly of the necessity of establishing in this country an Illuminating Engineering Society. Gas men and electricians had their hands full turning out their commodity for others to use.

The next speaker, Mr. Wilson, also thought such an Association as was advocated most essential from a gas and electric lighting point of view; but he said the way the Society were going to work was quite another matter. In this respect he did not quite agree with Mr. Gaster, who claimed rather that a new branch of experts, called Illuminating Engineers, should be formed. Surely, at the present time the general consumer had quite sufficient experts. There were the consulting engineer, architect, quantity surveyor, sanitary inspector, and others, around him. If they were going to pile another percentage on to his bill, he might become sick of experts altogether. He rather favored the idea that the gas and electric lighting people should turn themselves from gas and electric engineers into Illuminating Engineers. Let these men join hands with the manufacturers, form a society, and educate themselves, instead of another branch of experts being founded.

Agreement with these views was expressed by Mr. Cooper, who did not think the Illuminating Engineer would be welcomed by the architect. The average building would not stand the fee of the Illuminating Engineer. As to the founding of a new Society, he would ask Mr. Gaster to pause, as there were already so many that it was becoming impossible to attend the meetings of all. There was an Institution of Electrical Engineers, and he thought a committee of this body could do excellent work in collecting data about illumination. Even if they were not unbiased—well, he did not know that they would have unbiased opinions at a meeting of the Society of Illuminating Engineers. His feeling was that it would be much better to utilize the Institution of Electrical Engineers and other bodies, and have a joint committee, if necessary.

Mr. F. W. Goodenough said that, to his mind, Mr. Gaster had proven the necessity for an increased study of the science of illumination, rather than the necessity for the expert Illuminating Engineer or even for the institution of another society. As had already been remarked, there were a good many societies already; and he did not think Mr. Gaster had proved his case for another one. He had undoubtedly proved his case for an increase of knowledge on the question of illumination; and possibly a journal devoted entirely to the subject might be of great interest to those who were responsible for the lighting of premises. Just who was responsible, was, of course, a question nowadays; but speaking from his own knowledge of the gas industry, it was a fact that the public were, in a very large and increasing measure, asking the supplier of the illumination to also furnish them with information as to how the illumination could best be used and applied. The Gas Light and Coke Company found that the public looked to them for considerable assistance in this particular. They did not pay for it; and he did not think that they would be very willing—more especially the average householder or the small shopkeeper, for whom it was as important a matter that their illumination should be carried out on scientific lines as it was for large buildings—to pay an Illuminating Engineer.

The shopkeeper or householder, after listening to the various arguments of the gas and electric light man, would make up his mind which he would use, and then he looked to the supplier of the illuminant to advise him as to which were the best types of lamps or burners to use, and how best they could be arranged in the premises to be lighted. His company found an increasing call upon them for such advice. They had to employ experts who devoted themselves to practically nothing else but arranging installations for consumers; and they were at the present time holding continuous classes for the instruction in the art of illumination of the whole of the staff who had to deal with the public, because they believed it was right that they should be in a position to furnish information on this point. It was a great advantage to the makers of any illuminant—whether gas or electricity—to be as closely as possible in touch with the users of what was produced. It was quite right that the finest advertisement was that the goods supplied should be used to the best advantage, the wasteful burner or lamp was the worst enemy of the supplier of gas or electricity. The difficulty, of course, in regard to Illuminating Engineers would be to find thoroughly impartial as well as skilled men to take up the profession. It was almost impossible nowadays to find anyone who was not biased one way or the other, or not prejudiced in the matter of gas or electric light. In his opinion, the suppliers of the illuminants were the people to furnish the advice required. In the United States, where the Illuminating Engineering Society had flourished to such an extent, it should be pointed out that in a large number of cases gas and electricity were supplied by the same authorities.

Speaking as an electrical engineer, Mr. J. Harrington remarked that another expert on the job would simply mean an extra percentage to be added to the bill. He thought both gas and electrical engineers were really Illuminating Engineers; they did the best they could with their respective commodities. Mr. C. Le Maistre pointed out that at present electricians were somewhat hampered by restrictions in the 1882 Act; and he hoped when an Illuminating Engineering Society was formed the first thing they would do would be to try and put the electrical engineer on exactly the same basis as the gas engineer was now, so that he could go to the consumer and advise him as to the best appliances to employ and the most suitable way of using them. Mr. J. S. Dow said the distribution of light and illumination was a very wide question; and he referred to a discussion on photometry in which most divergent views were expressed. What was wanted, he thought, was to get together people who held these different views, and find out what really was at the bottom of it all. They should have the views of the oculists on illumination, and those of architects as to the æsthetic side. It seemed to him that too much of the discussion had turned on the supposition that the Illuminating Engineering Society would be simply a society of gas and electric people got to together to exchange views. But the question of the distribution of light and illumination was a far wider one than could be dealt with by them. How many Illuminating Engineers, he asked, were practising in America? He should think very few indeed. He did not doubt for a moment that everybody connected with lighting would do his own share of illuminating engineering, though he might not call himself one. They wanted a place where they could get together all the different results. At present the data were scattered. Let them get the people who knew something about photometry and lighting to meet together and find out what good lighting really did consist of. The arrival of the Illuminating Engineer in any case he imagined must be a question of years. Mr. F. Broadbent thought that, while Mr. Gaster had made out that illuminating engineering ought to be more studied than it was just now, he had not shown a good case for the introduction of a new specialist—the Illuminating Engineer.

In replying to the discussion, Mr. Gaster said the Illuminating Engineer would be an impartial authority who would tell the consumer what to do. If the consumer could go to somebody who had "no axe to grind," he would take his advice. It was only by the co-operation of the representatives of different illuminants that views could be exchanged.

Votes of thanks to the author and to the Chairman concluded a lengthy and animated meeting.

ITEMS OF INTEREST FROM VARIOUS LOCALITIES.

Mr. F. V. Young, of Cleveland, O., informs us that Messrs. H. L. Smith, Jno. E. Maxwell, M. S. Merchant and others have incorporated the Metropolitan Artificial Gas Company, with headquarters in Lima, O., for the purpose of making fuel gas "from swamp and bog soil." He fails to explain, however, how the gas is to be made, etc., wherefor we may guess that marsh gas will be a prominent feature or volume in its composition.

"W. E. M." writing from Beardstown, Ills., under date of the 27th ult., forwards the following interesting budget respecting the newly instituted gas division of the Beardstown Light and Power Company: "Dear Journal: The consulting engineer for our gas enterprise is Mr. George F. Goodnow, of Chicago. The contract for all of the gas machinery was awarded to the Western Gas Construction Company, of Fort Wayne, Ind. The sub-contractor for building the two benches of 6's, one filled with fours as a beginning, was the Laclede-Christy Clay Products Company, of St. Louis. A 50,000 capacity holder was erected in a steel tank. The generating house, 35 feet by 75 feet, with walls 21 feet high above the floor line, was constructed of Galesburg building brick, on a concrete foundation with steel roof trusses and Ludowici-Celadon tile roof. About 5½ miles of mains have been laid, ranging from 8 inches to 4 inches, of threaded steel, line pipe. The manufacture and sale of gas were begun on October 16th, and we now have 100 customers connected up. The selling rate is $1.50 per 1,000 gross, with 10 per cent. discount, if accounts are settled by the 10th. The consumers of gas are delighted with it for lighting and cooking, and the prospects for a growing, thriving business could not be better. Beardstown is on the Illinois river, 45 miles west of Springfield, 90 miles southwest of Peoria, and 111 miles north of St. Louis, and is located on the C., B. & Q. and B. & O. Railways. Our city has a population of more than 6,000, and the per cent. of modern homes that are occupied by the owners, is far above the average. The houses are unusually well painted and of modern architecture, and the tenements of the people present an unusually comfortable, well kept and prosperous appearance. The division headquarters, machine shops,

car shops and round houses of the division are located here, and the average monthly payrolls of the C., B. & Q. Railroad of Beardstown, average between $45,000 and $55,000 per month. Mr. W. F. Dunn, of Rock Island, Ills., Superintendent of our gas department, was connected with the gas division of the Peoples Power Company, of Moline, Ills., for the past 16 years. Our capital stock is $100,000, and we have outstanding $75,000 of 5 per cent. bonds, with the right to issue $25,000 additional."

THE annual meeting of the New Haven (Conn.) Gas Company was held the 2d inst. There was no change of moment in the election.

WITH exceeding satisfaction we report that Mr. N. T. Meginness, formerly Secretary of the Consolidated Gas Company, of Baltimore, Md., has been appointed Trust Clerk to the Supreme Court of Maryland, vice the late Mr. William R. Brewer.

THE Green Bay (Wis.) Gas and Electric Company has notified its customers that hereafter, or until further notice, the net rate for gas will be $1.50 per 1,000 cubic feet. This is a concession of 25 cents per 1,000.

NOTICE has been given that the plant of the Connellsville and New Haven Gas and Water Company, of Connellsville, Pa., is for sale. The controlling interest in the Company is held by the West Penn Electric Company.

THE Denver (Col.) Gas and Electric Company has arranged to extend its main system to and through the borough of Lakeside. This place is one of Denver's noted summer resorts.

MR. FRED. L. FULLAM, General Manager of the Clinton Gas Light Company and of the Leominister (Mass.) Gas and Electric Company, has resigned both positions. Mr. John F. Madden, Superintendent of the Clinton (Mass.) Gas Light Company, also handed in his resignation. The resignations became effective the 1st instant.

MR. H. W. STARR has resigned from the place of Manager of the Mohawk Gas Company, of Schenectady, N. Y., to accept a responsible place with the General Electric Company. His successor is Mr. A.V. Wainright.

MR. ABNER C. JONES has resigned from the field service of the Western Gas Construction Company to assume the place of foreman of the generating division of the St. Paul (Minn.) Gas Light Company, under the immediate direction of Supt. V. L. Elbert.

A CORRESPONDENT in Denver, Col., writing under date of the 23d inst., incloses the following: "There is no more emphatic nor more conclusive evidence of the rapid growth of Denver than the average daily sendout of the Denver Gas and Electric Company for the past few days. The average daily output just now is 3 millions cubic feet. Last year at the corresponding time the sendout never went above 2½ millions, and the proprietors hardly hoped that the 3-million point would be reached so soon. The capacity of the works is equal to a far greater output. One-quarter of the entire population of Denver use gas for cooking, and the number of consumers is increasing at the rate of about 200 per month. Another fact that points to the cleverness with which the Company is managed is that the growth of its electric division keeps about even pace with that of its gas division."

THE Supreme Court of the United States has handed down a decision in the case of the city of Hutchinson, Kas., and the Hutchinson Water, Light and Gas Company, dismissing the Company's demurrer to the pleadings. At the commencement of the proceedings the Company brought suit to secure an injunction to prevent the city of Hutchinson from granting a franchise to furnish electric light to the Peoples Electric Light and Power Company, and against the latter Company to prevent its operating under the franchise. In Judge Pollock's court, at Topeka, the city entered a demurrer to the grounds upon which the the Water Company based its complaint, which was that the franchise granted it by the city was exclusive and had been paid for by a valuable consideration. Judge Pollock sustained the demurrer. The Water, Light and Gas Company appealed to the United States Supreme Court. About a month ago the case was heard before this highest court, and the decision handed down is the result of this hearing. It denies the power of the city of Hutchinson to grant an exclusive franchise to any public service corporation, and while in the case the franchise specified was for furnishing light, it was stated by attorneys that it will cover gas, water or other divisions of a public service corporation.

MR. CHARLES F. HESSER, a close intimate of the late Gen. Andrew Hickenlooper, and for a long time Manager of the electric division of the Cincinnati Gas and Electric Company's business, died at his home in Norwood, O., the morning of the 20th ult. He was in his 62d year, and his immediate survivors are his widow, a son and two daughters. His funeral was from the home of his nephew, Mr. W. R. Zulick, Norwood, the morning of December 22d.

"G. G. R.," forwards the following. It was found by him in a recent issue of the San Francisco *Chronicle:* Capt. Watt, of the record breaking Lusitania, was talking about machinery. "Machinery is delicate stuff," he said, "and the amateur is wise to let it alone. You know about the man who blew down into the gas meter?"

"No."

"Well, at the club one night, a certain man complained bitterly about his gas bills.

"'Hang it all,' he said, 'my bills are something enormous. I'm sure I don't burn all that gas. The company, consarn it, is cheating me.'

"A friend spoke up and said:

"'Look here, do you want to know how to get the better of the gas company?'

"'Gee, I just do!' exclaimed the man.

"'Then,' said the friend, 'blow down the meter. Every night, before you turn in, blow down the meter. The meter, you see, is full of little wheels, all turning, turning, piling up big bills against you every time you light the gas. But just blow down the pipe and'——

"The friend gave a loud laugh at the delightful thought.

"Just blow down the pipe, and—he, ha, ha—all the little wheels will turn the other way.'

"The man thanked his friend for this good and valuable advice, went straight home, and blew a long and powerful blast down the pipe of the gas meter before retiring. He did this every night. Not once did he forget, the last thing before going to bed, to blow down the meter with terrific force.

"Well, in due course, at the month's end the inspector came.

"The man welcomed the inspector a trifle nervously, and hung about the cellar door to hear what the fellow would have to say after his inspection.

"The inspector emerged from the cellar studying a column of figures with a puzzled frown. He looked up at the master of the house and said in a strange voice:

"'Well, Mr. Smith, I don't know what the dickens has been happening to your meter, but the company owes you $34.07.'"

THE Cruse-Kemper Company, of Philadelphia, informs us that the following will continue to represent it in the districts named: Western Sales' Engineer, Mr. Henry I. Lea, 616 The Rookery, Chicago, Ills. Pacific Coast Agents, Hallidie Machinery Company, Seattle, Wash.

THE new net rate established by the Waltham (Mass.) Gas Company is $1.15 per 1,000 cubic feet, a concession of 5 cents per 1,000. It is further agreed that the rate will be put at $1 in a twelvemonth.

THE main offices of the Gas Bench Construction Company have been removed from the Linmar Building, St. Louis, Mo., to the new structure known as the Metropolitan Building, corner Grand and Olive streets, St. Louis. This seems to prove that the Company is going right along, for the change was solely made because the old quarters were too small, and the required space could not be secured in the Linmar Building.

AT the annual meeting of the Lincoln (Neb.) Gas and Electric Light Company the reports for the twelvemonth showed a greatly strengthened position. No change was made in the executive management, which is wisely and happily dominated by Mr. H. L. Doherty.

THE annual meeting of the Laclede Gas Light Company, of St. Louis, Mo., is set for the 20th inst.

MR. FRANK J. BAKER, of the engineering staff of the Hutchinson (Kas.) Water, Light and Gas Company, was instantly killed the other day by the explosion of a copper float which he was testing.

THE gas plant recently constructed for the Campbell Brothers, at Huron, S. D., is now in active working. The concern starts in with 200 consumers. Seven miles of mains were put down.

THE AMERICAN GAS LIGHT JOURNAL

A. M. CALLENDER & CO.,
PROPRIETORS.

THOS. J. CUNNINGHAM,
ELBERT P. CALLENDER,
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NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

NOTIFICATION RESPECTING ADVERTISING.

Orders for new advertising, or for changes in standing advertisements, to insure attention in the issue following their reception, must be in hand any time of Wednesday.

AGENTS:

New York—American News Co., 39 and 41 Chambers St.
Germany—Lemcke & Buechner, of New York.
England—Aug. Siegle, 30 Lime Street, London.

MONDAY, JANUARY 6, 1908.

The Market for Gas Securities.

The quotations for Consolidated gas came in this morning (Friday) at 95 to 97, which rating is about a point over that for a week ago. Very little trading was done in it between times, but the general tone was towards strength. The gas bond market is fairly active, and this is especially so in respect of New York, Cincinnati, Chicago and Boston underlying bonds. Brooklyn Union remains unaccountably weak, and the only seeming cause therefor is the generally lax condition of business of all sorts.

Massachusetts gas, both common and preferred, shows considerable strength, as does Peoples, of Chicago. Changes are said to be impending in the executive management of that Company. Washington, D. C., is offered at 375.

Gas Stocks.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

16 WALL STREET, NEW YORK CITY.

JANUARY 6.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked.*
Consolidated	$73,177,000	100	95	97
Central Union Gas Co.—				
1st 5's, due 1932, J. & J	3,000,000	1,000	98	97
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	—	105
Mutual	2,500,000	100	—	170
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	80	85
New York & Richmond Gas Co. (Staten Island)	1,500,000	100	37	43
Mtg. Gold Bds. 5 p. ct.	1,000,000	—	98	104
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	90	98
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	100	105
Con. 5's, due 1945, J. & J.	1,500,000	—	97	101
Standard	5,000,000	100	70	100
Preferred	5,000,000	100	100	125
1st Mtg. 5's, due 1930, M. & N.	1,500,000	1,000	100	105
The Brooklyn Union	15,000,000	1,000	84	90
1st Con. 5's, due 1948, M. & N.	15,000,000	—	91½	92
Yonkers	999,650	500	130	—
Out-of-Town Companies.				
Bay State	50,000,000	50	½	¾
" Income Bonds	2,000,000	1,000	—	75
Binghampton Gas Works	450,000	100	—	65
" 1st Mtg. 5's	500,000	1,000	95	100
Boston United Gas Co.—				
1st Series S. F. Trust	7,000,000	1,000	82	85
2d " " "	3,000,000	1,000	47½	50
Buffalo City Gas Co.	5,500,000	100	5	8
" " Bonds, 5's	5,250,000	1,000	63	66
Capital, Sacramento	500,000	50	—	35
Bonds (6's)	150,000	1,000	—	—
Chicago Gas Co. Guaranteed Gold Bonds	7,000,000	1,000	104	103¾
Cincinnati Gas and Electric Co.	29,500,000	100	92¼	93
Columbus (O.) Gas Co., 1st Mortgage Bonds	1,500,000	1,000	92	98
Columbus (O.) Gas Lt. & Heating Co.	1,682,750	100	87	88
Preferred	3,036,500	100	107½	108
Consumers, Toronto	2,000,000	50	200	204
Consolidated, Baltimore	11,000,000	100	—	90
Mortgages, 6's	3,000,000	—	—	118
Chesapeake, 1st 6's	1,000,000	—	—	—
Equitable, 1st 6's	910,000	—	—	—
Consolidated, 1st 5's	1,490,000	—	—	112
Consolidated Gas Co. of N. J.	1,000,000	100	15	17
Con. Mtg. 5's	880,000	1,000	92	95
Bonds	75,000	—	—	100
Detroit City Gas Co.	6,000,000	50	—	50
" Prior Lien 5's	4,61[illegible],000	1,000	—	98
Detroit Gas Co., 5's	381,000	1,000	75	80
" Inc. 5's	16,000	100	98½	100
Equitable Gas & Fuel Co., Chicago, Bonds	2,000,000	1,000	—	101
Essex and Hudson Gas Co.	6,500,000	—	39	40
Fort Wayne	2,000,000	—	—	—
" Bonds	2,000,000	—	55	—
Grand Rapids Gas Lt. Co., 1st Mtg. 5's	1,225,000	1,000	104½	105
Hartford	750,000	25	190	200
Hudson County Gas Co., of New Jersey	10,500,000	—	100	105
" Bonds, 5's	10,500,000	—	101	102½
Indianapolis	2,000,000	—	60	70
" Bonds, 5's	2,650,000	—	104½	105
Jackson Gas Co.	250,000	10	82	—
" 1st Mtg. 5's	290,000	1,000	97	100
Kansas City Gas Light Co., of Missouri	5,000,000	100	—	36
Bonds, 1st 5's	3,822,000	1,000	102	104
Laclede, St. Louis	10,000,000	100	97	97¼
Preferred	2,500,000	100	92½	93
Bonds	10,000,000	1,000	104	104¼
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	143	145
Madison Gas & Elec. Co.				
" 1st Mtg. 6's	360,000	1,000	106	108½
" 6 per cent. scrip, due 1910	100,000	25	60	60½
Massachusetts Gas Companies, of Boston	23,000,000	100	49	50
Preferred	25,000,000	100	77	78
Montreal, Canada	2,000,000	100	213	215½
Nashville Gas Lt. Co.	1,000,000	100	110	—
Newark, N. J., Con. Gas Co.	6,000,000	—	56	58
Bonds, 6's	5,000,000	—	137	138
New Haven	2,000,000	25	200	—
Peoples G. Lt. & Coke Co., Chicago	25,000,000	100	80¼	80½
1st Mortgage	20,100,000	1,000	—	—
2d "	2,[illegible]00,000	1,000	104	—
Rochester Gas & Elec. Co.	2,150,000	50	88	—
Preferred	2,150,000	50	118	—
Consolidated 5's	2,000,000	—	104½	105½
San Francisco, Cal.	15,500,000	—	—	—
St. Joseph Gas Co.—				
1st Mtg. 5's	751,000	1,000	92	—
St. Paul Gas Light Co.	1,[illegible]00,000	100	45	47
1st Mortgages, 6's	6[illegible]0,000	1,000	113	116
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General Mortgage, 5's	2,4[illegible]5,000	1,000	93¾	—
Syracuse, N. Y.	1,978,000	100	50	55
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Washington, D. C.	2,600,000	20	—	375
1st Mortgage, 6's	600,000	—	—	—
Western, Milwaukee	4,000,000	—	—	—
Wilmington, Del.	600,000	50	250	—

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DIVIDEND NOTICE.

OFFICE OF THE UNITED GAS IMPROVEMENT CO., N. W. CORNER BROAD AND ARCH STS., PHILADELPHIA, PA., Dec. 11, 1907.

The Directors have this day declared a quarterly dividend of 2 per cent. (one dollar per share), payable Jan. 15th, 1908, to stockholders of record at the close of business, Dec. 31, 1907. Checks will be mailed.

1697-5 LEWIS LILLIE, Treasurer.

Estimates furnished for the erection of complete gas works or the extension and modernizing of old works. All work warranted. Both water gas and coal gas.

EMPIRE GAS IMPROVEMENT & CONSTRUCTION COMPANY,
1688-tf 49 Wall Street, New York.

Position Wanted

By Young Man of Wide Experience as Superintendent or General Manager of Water Gas Plant.

A-No. 1 references from both operators and builders of plants. Address,

1700-1 "PROMOTER," care this Journal.

WANTED,

Position as Superintendent or Manager of Gas Plant,

By a young married man with 7 years' practical experience in the manufacture and distribution of both coal and water gas. Can furnish references. Address, "L. J. T.,"

1700-2 Care this Journal.

WANTED,

Position as Superintendent or Manager,

By one who has had wide practical experience and has met with success in above capacity. Can furnish excellent references. Address, "J. O.,"

1697-tf Care this Journal.

Position Wanted.

Young married man, 30, having held various executive positions, covering all departments of gas business, works, distribution and office, during the past 7 years, and now superintendent of a company in the Eastern States, desires to change position between now and spring of 1908. Good reasons for making change. Best references as to character and ability. No objection to going to any part of the United States or abroad. Address, "C. P. N.,"

1698-4 Care this Journal.

Situation Wanted.

Your next superintendent, experienced in the manufacture, distribution and construction of high and low pressure water gas of various types, will be able to take charge after Jan. 1, 1908. Address, "O. C. G.,"

1699-2 Care this Journal.

Position Wanted

AS GAS MAKER.

A young married man, with 10 years' practical experience in water gas making and distribution department. Can do anything about the works. NoW employed as superintendent of small works. Can run 1 or . machines. Can furnish any references that may be required.

1700-1 Address, "GAS MAKER," care this Journal.

WANTED,

Position by All-Round Gasfitter and Complaint Man.

Is capable of taking charge of distribution department. A-1 references. Nine years' experience.

1700-1 Address, "INDIANA," care this Journal.

Position Wanted.

A successful and competent young gas man would like to communicate with some gas company likely to need a gas manager in the near future. Is thoroughly up to date on all new business methods and distribution systems, and both coal and water gas manufacture. Will be open for a position between December 15, 1907 and January 1, 1908. Can show a very good record. Address, "D. K.,"

1699-8 Care this Journal.

Position Wanted.

Am 28. Desire position as superintendent of

DISTRICTION.

Six years' experience. Now employed by a large corporation. Address,

1700-tf "O.," care this Journal.

WANTED, FOR WESTERN TERRITORY,

A Traveling Salesman for a Leading Line of Gas Stoves and Ranges already Established.

Must be thoroughly competent, of extended experience and good, established connections among gas companies. A permanent and good paying position to the right man. Address, giving age, experience and references,

"C. S. M.,"

1689-tf Care this Journal.

WANTED,

EXPERT GAS ENGINEER,

Who thoroughly understands the erection and operation of gas plants, piping of cities, etc. Will only consider man with broad experience and great executive ability. Salary, $8,000 to $10,000.

(Z Eng. 5322) HAPGOODS, 309 Broadway, New York.
1698-3

WANTED,

ONE COPY OF VOLUME 18, AMERICAN GAS LIGHT ASSOCIATION PROCEEDINGS.

Will buy or exchange. Address,

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FOR SALE,

FOUR SECOND-HAND PURIFIERS.

Dimensions, 10 feet by 14 feet by 3 feet deep, with dry center valve and connecting pipes 10 inches diameter. Seal 16 inches deep. Inquire of the

DAYTON GAS LIGHT AND COKE CO.,
1697-tf DAYTON, O.

FOR SALE,

One 48-Inch Station Meter Complete.

It has not been connected since rebuilt 9 months ago by Helme & McIlhenny, Philadelphia, Pa. We refer you to them.

STANDARD GAS AND ELECTRIC CO.,
1686-tf RALEIGH, N. C.

FOR SALE,

Six 24-Inch Best Quality Rubber Gas Main Bags, 4 of which have never been used, 2 having been used but once. Also,

Three 24-Inch Stoppers.

Address, "A. B. C.,"

1699-3 Care this Journal.

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Price, $5. For Sale by

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TWO MODERN PLANTS SERVING THREE TOWNS OF 35,000 POPULATION AND LOCATED IN THE EASTERN STATES.

FOR PARTICULARS, ADDRESS

"OWNERS,"

Care this Journal.

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M. J. LOXLEY COMPANY,

Land Title Building, Philadelphia, Pa.

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Utilize Your Gas Liquor.

NO EXTRA LABOR OR OPERATING EXPENSES.

IMPROVED AMMONIA CONCENTRATOR.

About 100 in use. Write to

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MICHIGAN AMMONIA WORKS, - Detroit, Mich.

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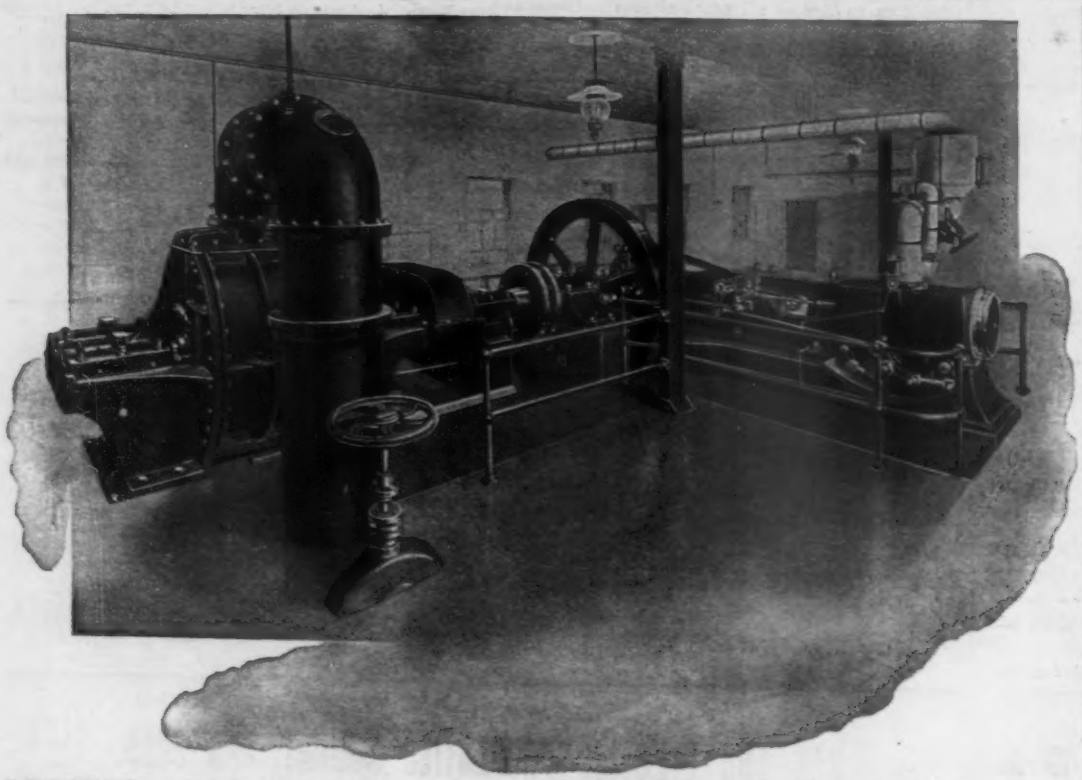
AND HIGH PRESSURE GAS PUMPS.



THIS cut shows one of our High Pressure machines and a 4-valve engine connected by one of our leather link flexible couplings. Two of these units were installed for the Peoples Gas Light and Coke Co., Chicago, at their 73d St. Station. Each machine has a capacity of 14,000,000 cubic feet per day.

We also manufacture

GAS VALVES,
BY-PASS VALVES,
PRESSURE REGULATORS,
ETC., ETC.

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Compagnie pour la Fabrication des Compteurs et Materiel d'Usines a Gaz, Paris, France.

24-inch connections; 84-inch face to face flanges; 90 inches floor to center of dial.

The 5,000,000 Cubic Foot Per Day
ROTARY STATION METER

On Car for City Gas Company, Los Angeles, California.

OCTOBER 22d, 1907, we received an order from, and are now building, a **ROTARY STATION METER** of 4,000,000 cubic feet per day for the **Brooklyn Union Gas Co.**, to be installed in its **Nassau Works!**

OCTOBER, 1906, the **Consolidated Gas Co., of New York City,** installed in its **21st Street Works** a **ROTARY STATION METER** of 4,000,000 cubic feet per day!

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ROTARY METER COMPANY

One-half the cost—One-tenth the space of old style wet meters.

When in need of Station Meters, write

ROTARY METER COMPANY,

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Send for Catalog.

P. PLANTINGA, President W. E. STEINWEDELL, Secretary

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EXHAUSTERS, CONDENSERS, SCRUBBERS,
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VALVES, CONNECTIONS.

BY PRODUCT MACHINERY.

COMPLETE GAS PLANTS.

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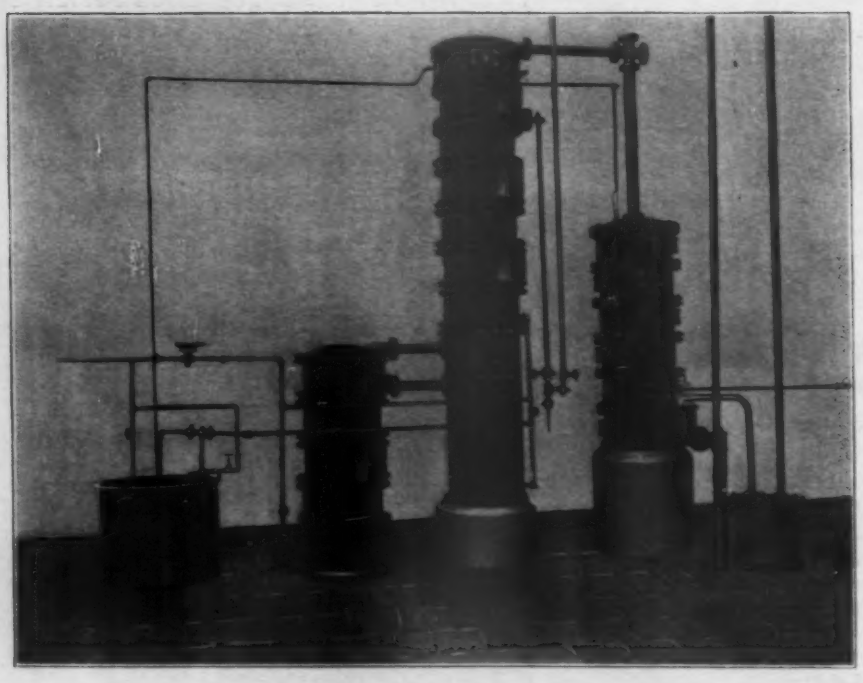

AMMONIA CONCENTRATOR FOR FREE AND FIXED AMMONIA.

THE GAS MACHINERY CO.

CLEVELAND, OHIO.

ANNOUNCEMENT.

January 1st, 1908

TO OUR PATRONS AND FRIENDS:

Our new Firebrick Factory has been completed and we are now ready to take orders for high grade fireclay products of any description and magnitude. We design and build

Coal Gas Benches,

VERTICAL, INCLINED OR HORIZONTAL RETORTS,

LATEST PATENTED SYSTEMS.

Coke Ovens,

BEEHIVE AND BY-PRODUCT CONSTRUCTION.

Manufacture Linings for Water Gas Apparatus, Rotary Cement Kilns, Blast Furnaces and Stoves, Steel Furnaces, Lime Kilns, Cupolas, etc., etc.

SPECIAL GLASS HOUSE REFRACTORIES.

WE IMPORT THE FINEST FIRECLAY FOR SPECIAL HIGH GRADE WORK.

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Bench construction of most modern type, with horizontal, inclined and vertical retorts, together with retort houses, coal and coke handling machinery, specially designed to suit the characteristic requirements of the benches.

CONSULTING AND CONSTRUCTING ENGINEER.

Plans for modern and up-to-date coal and water gas plants. Modernizing existing plants to cheapen costs of production. Valuation of plants, etc., etc.

Sole representative of the Dessau Vertical Retort Bench Co.,

Berlin, Germany.

"CHRISTY PLANT," FORMERLY CHRISTY FIRECLAY CO.

"LACLEDE-CHRISTY" GAS ENGINEERS.

"LACLEDE PLANT," FORMERLY LACLEDE FIREBRICK MFG. CO.

OUR ENGINEERING DEPARTMENT IS EQUIPPED TO DESIGN, CONTRACT FOR AND BUILD COMPLETE GAS PLANTS FROM BREAKING OF GROUND TO MAKING GAS.

IF YOU WANT { DESIGN, MATERIAL, WORKMANSHIP, BENCHES, RESULTS, } THE BEST

COMMUNICATE WITH

LACLEDE-CHRISTY CLAY PRODUCTS CO.,

ST. LOUIS, MO.

"EVERYTHING THAT IS MADE FROM CLAY."

Ramsdell

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For Residential Illumination.

No. 6 Bijou Lamp—½ Actual Size.

There is but one inverted gas lamp suitable for residential illumination—The "Bijou."

It represents the proper unit for the home and meets the approval of the illuminating engineer in providing a correct distribution of light in fairly small rooms. It is also useful as an intermediate vehicle in the lighting of large areas.

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No. 6 Bijou Lamp is new this season. It possesses all the features which had made our No. 3 Bijou Lamp the most popular inverted lamp in the world, with the added advantage of a DOUBLE MIXING CHAMBER and the other newly patented features embodied in our well-known No. 5 Lamp. It can be supplied with Heat Deflector (No. 6 H. D.) and 2¼-inch Globe Holder (No. 6 E.), to fit electric glassware, at small additional cost. We are also prepared to supply green and white *Parabol Reflectors*, No. 3054—same style as our No. 3053—and green and white *Dome Shade*, No. 3 5½, for use on the No. 6 E Bijou Lamp. Thus the field of usefulness of the Bijou Lamp is constantly extending.

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GEO G. RAMSDELL, Pres't.

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Chicago—R. Williamson & Co. San Francisco, Cal.—Thos. Day Co.
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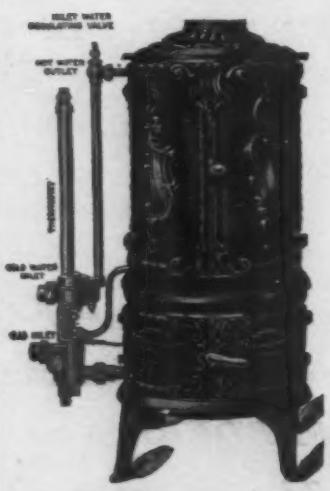

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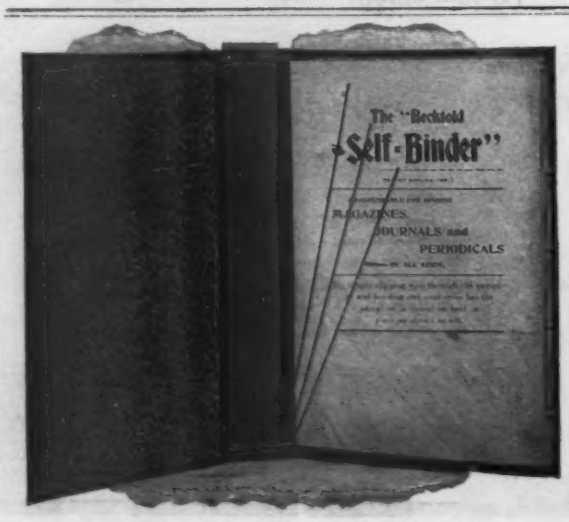

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THE UNITED STATES.

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NO DUMPING OF METERS TO GET THE WATER OUT.

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Bray's Union-Jet.

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Steel Water Towers

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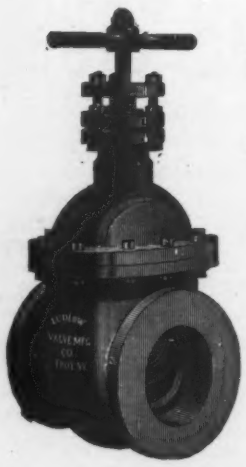

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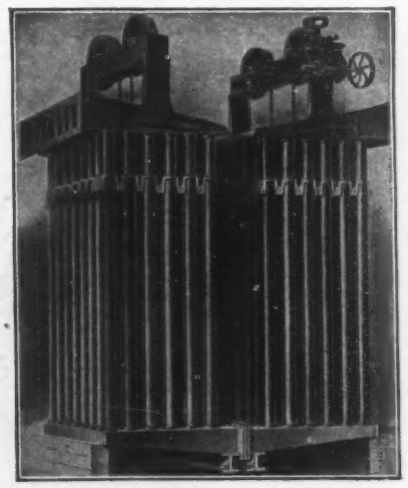

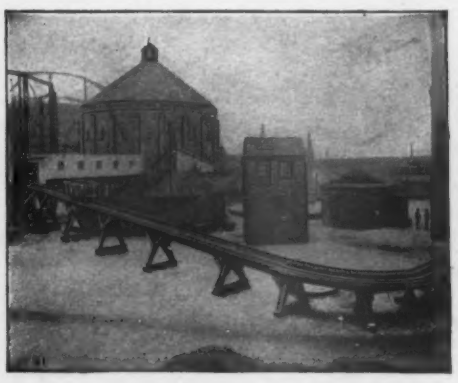

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For Handling Coal and Coke in Gas Works.

The cost of handling coal and coke by this method is only the expense of loading the cars (one man) and the power to drive the cable. Every inch of ground is available, as the space under the trestles can be utilized for storage, if necessary. These railways are built of different types, to handle any quantity of material, large or small.

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For every 1,000 cu. ft. of water gas 40 to 48 lbs. of anthracite are consumed in the generator, while 24 lbs. should theoretically be enough. The 40 per cent. to 50 per cent. excess is the margin of possible saving. By passing the hot, waste, stack-valve gases through a GREEN AIR HEATER you can cut down the bill for generator coal by at least 10 per cent. The air forced to the generator is passed through the tubes of the Air Heater and absorbs the waste heat from the stack-valve gases and returns it to the generator. The higher temperature in the generator, carburetter and superheater results, also, in a saving of oil, amounting to about one-fifth gallon per 1,000 cu. ft. of gas.

After the stack-valve gases have passed through the Green Air Heater they may be then passed through a GREEN FUEL ECONOMIZER to heat the boiler feed water, saving as much as 25 per cent. of the boiler fuel. The result is that a Green Air Heater and a Green Fuel Economizer will save from 50 per cent. to 60 per cent. of their first cost annually in a water gas plant. Write for circular "AG" and results of actual tests.

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(Sole builders of the Green Fuel Economizer in the United States, and of Fans, Blowers and Exhausters.)

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For Every Gas Plant.

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DOUBLE and SINGLE DISTRICT STATIONS,

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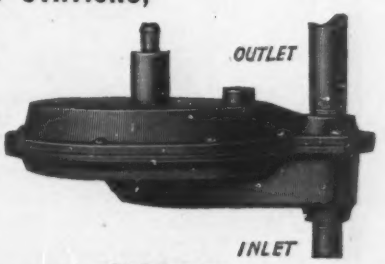

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"The Stationary Rotary."

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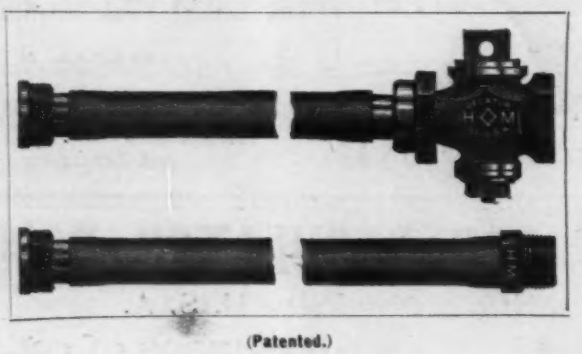

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There is no hit and miss policy in the manufacturing of Mueller Sweat Joint Gas Meter Connections.

Machines automatically shape the pipe ends to the exact depth and diameter of the fittings, which are specially cored and shouldered. These connections are uniform in length, strength and quality. Mueller red brass fittings are used.

Unconditionally Guaranteed. Prices upon application.

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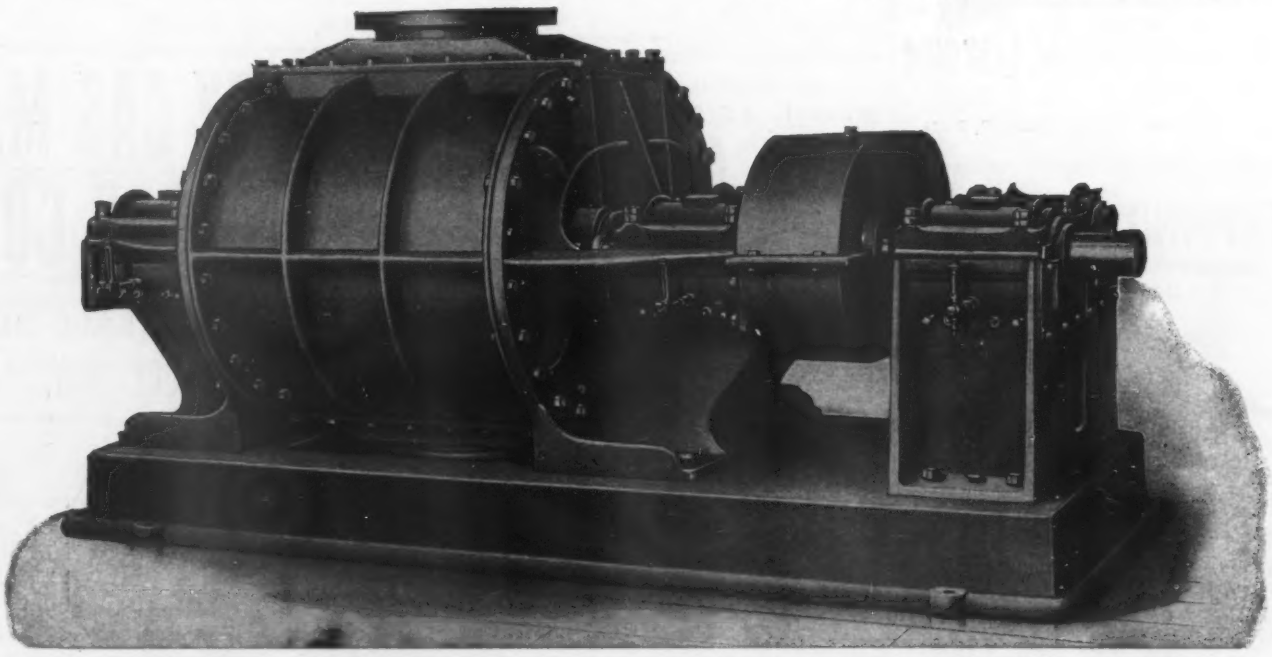
The highest efficiencies obtained. Most perfect devices for adjustment and maintenance of proper alignment. Use our flexible coupling to correct troubles caused by misalignment and engine shaft thrust. Our gas governor is the best. By-pass, gas valves and fittings.



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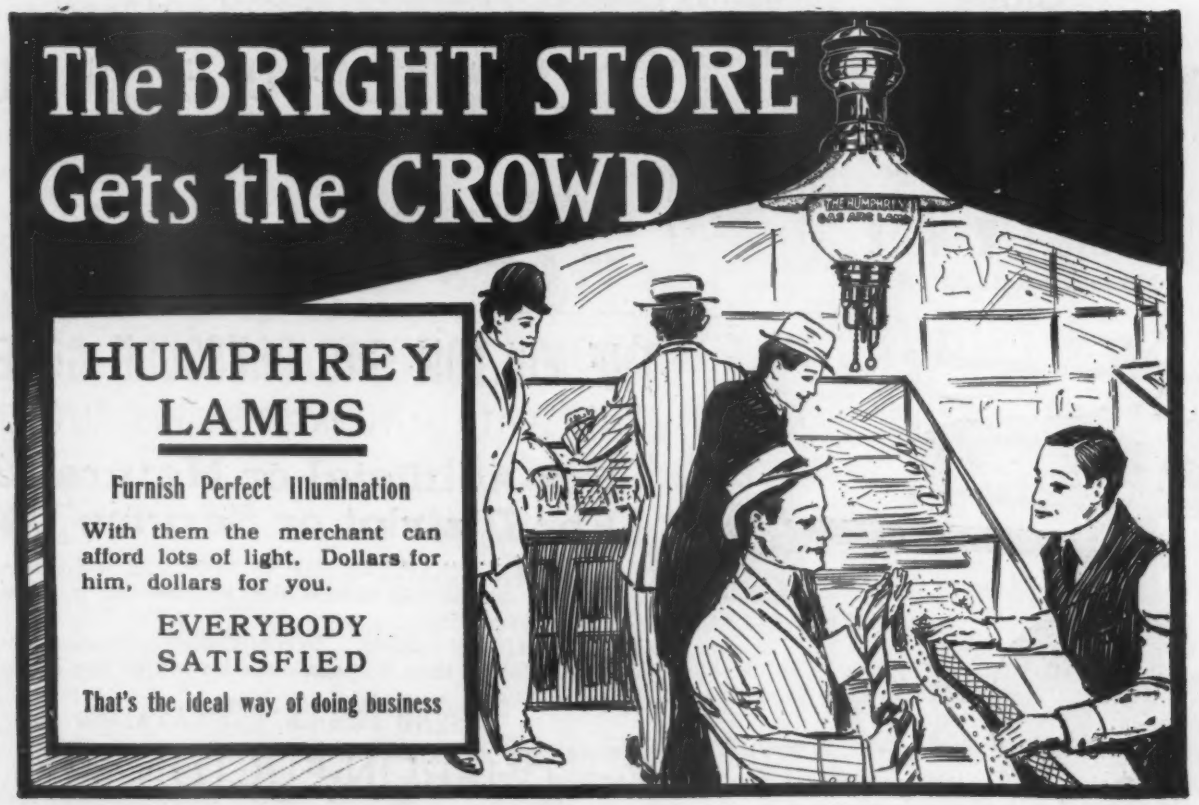

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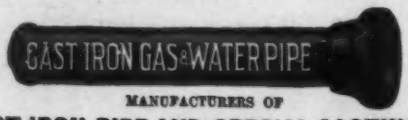

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CAST IRON PIPE AND SPECIAL CASTINGS

FOR WATER AND GAS.

Also, FLANGE PIPE, LAMP POSTS, Etc.

GAS TAPPING MACHINES

—FOR—

Drilling and Tapping Pipe under Pressure

WITHOUT ANY ESCAPE OF GAS.

They are Strong and Compact.

Size of Combination Drills and Taps ¾ to 4-inch.

Machines Sent to any Gas Company for Thirty Days' Trial.

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"THE MINER"

Globe Street and Boulevard Lamps.

Cheapest and Best

THOUSANDS IN USE WITH INCANDESCENT BURNERS.

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Chollar's System of Gas Purification.

THE PURIFIED GAS REVIVES THE FOULED OXIDE.

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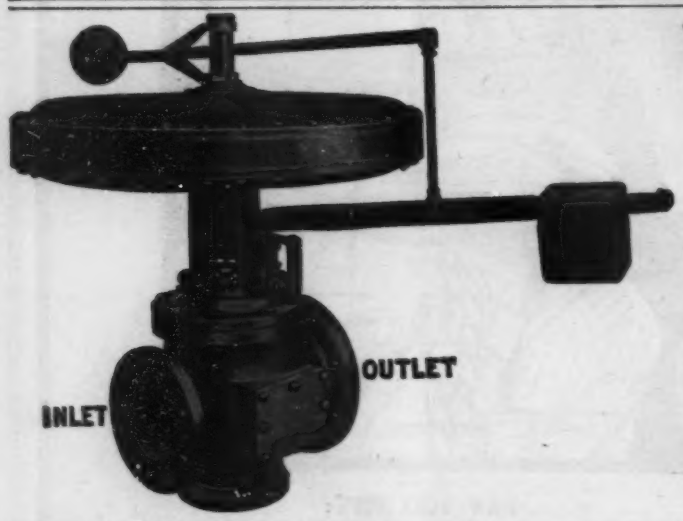

THE FULTON GAS PRESSURE GOVERNOR,

WITH AUTOMATIC SAFETY CUTOFF.

For Artificial or Natural Gas.
For District or Service Use.

Our DUPLEX SENSITIVE GOVERNOR, with Automatic Cutoff for district service, will reduce high pressure gas to inches of water without variation.

Absolutely safe and reliable. No complicated mechanism to get out of order. More than 20 years' experience with the largest gas companies.

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Photometrical and Experimental Apparatus.

PUBLIC LIGHTING TABLE.

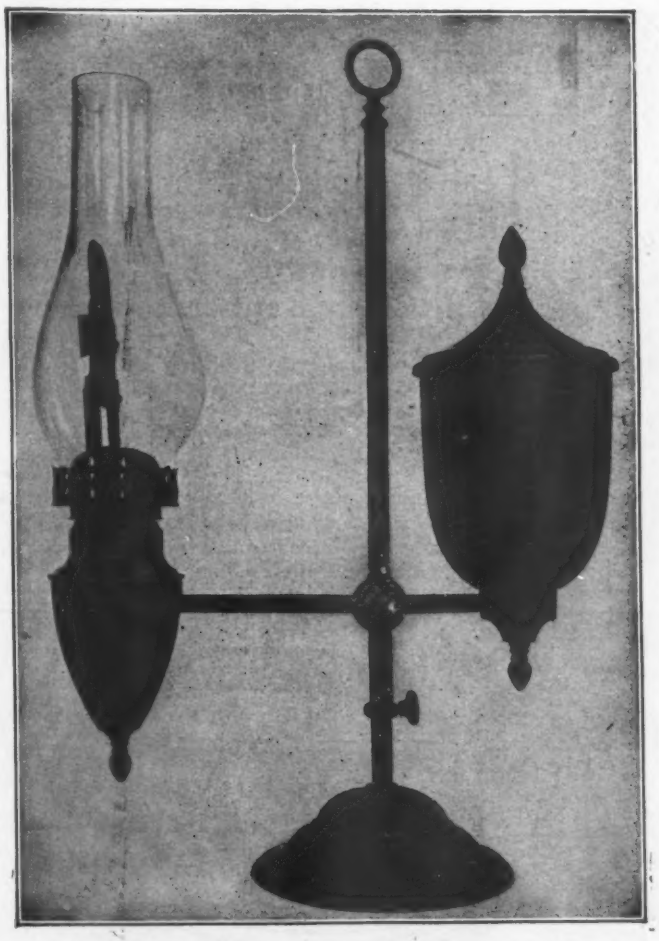
JANUARY, 1908.

Day of Week.	Date.	Table No. 1. FOLLOWING THE MOON. Light.	Extinguish.
Wed.	1	5.10 PM	6.20 AM
Thu.	2	5.10	6.20
Fri	3	5.10 NM	6.20
Sat.	4	5.10	6.20
Sun.	5	5.20	6.20
Mon.	6	5.20	6.20
Tue.	7	5.20	6.20
Wed.	8	9.40	6.20
Thu.	9	10 50	6.20
Fri.	10	11.50 FQ	6.20
Sat.	11	12.50 AM	6.20
Sun.	12	2.00	6.20
Mon.	13	3.00	6.20
Tue.	14	3.50	6.20
Wed.	15	4.50	6.20
Thu.	16	5.40	6.20
Fri.	17	No L.	No L.
Sat.	18	No L FM	No L.
Sun.	19	No L.	No L.
Mon.	20	5.30 PM	8.00 PM
Tue.	21	5.30	9.00
Wed.	22	5.30	10.00
Thu.	23	5.30	11.00
Fri.	24	5.30	12.00
Sat.	25	5 30	1.00 AM
Sun.	26	5.40 LQ	2.10
Mon.	27	5.40	3.20
Tue.	28	5.40	4 20
Wed.	29	5.40	6.10
Thu.	30	5.40	6.10
Fri.	31	5.40	6.10

TOTAL HOURS DURING 1908.

By Table No. 1.

	Hrs.Min.
January	228.30
February	187.30
March	192.00
April	160.10
May	155.10
June	138.00
July	155.50
August	173.40
September	185.20
October	214.00
November	218.10
December	226.40
Total, yr.	2235.00



THE ELLIOTT KEROSENE STANDARD PHOTOMETER LAMP.

❋❋❋

10-Candle Power.

❋❋❋

This lamp is a perfect substitute for the 10-candle Pentane Lamp hitherto used, and has the following advantages:

1st. It uses Standard Kerosene Oil (Pratt's Astral Oil or equivalent).

2d. It is remarkably steady. Will burn 24 hours continuously with less than 2 per cent. variation.

3d. It is much less dangerous than Pentane, which is a kind of gasolene.

4th. It is not easily affected by air currents in the photometer room.

5th. Since the lamp may burn continuously, the candle power of gas may be taken at any moment, if necessary. This insures steady illuminating power without waste of carburetting material.

6th. The first cost of the lamp brings it within the reach of even small gas works.

7th. Costs much less to maintain than a Pentane lamp or sperm candles doing the same service.

8th. Is not affected by the weather.

PUBLIC LIGHTING TABLE.

JANUARY, 1908.

Day of Week.	Date.	Table No. 2. NEW YORK CITY. ALL NIGHT LIGHTING. Complete Lighting in One Hour From Time Given P. M.	Complete Extinguishing in 50 Minutes From Time Given A.M.
Wed.	1	4.12	6.27
Thu.	2	4.12	6.27
Fri.	3	4.12	6.27
Sat.	4	4.12	6.27
Sun.	5	4.12	6.27
Mon.	6	4.12	6.27
Tue.	7	4.12	6.27
Wed.	8	4.22	6.22
Thu.	9	4.22	6.22
Fri.	10	4.22	6.22
Sat.	11	4.22	6.22
Sun.	12	4.22	6.22
Mon.	13	4.22	6.22
Tue.	14	4.22	6.22
Wed.	15	4.32	6.17
Thu.	16	4.32	6.17
Fri.	17	4.32	6.17
Sat.	18	4.32	6.17
Sun.	19	4.32	6.17
Mon.	20	4.32	6.17
Tue.	21	4.32	6.17
Wed.	22	4.42	6.12
Thu.	23	4.42	6.12
Fri.	24	4.42	6.12
Sat.	25	4.42	6.12
Sun.	26	4.42	6.12
Mon.	27	4.42	6.12
Tue.	28	4.42	6.12
Wed.	29	4.47	6.07
Thu.	30	4.47	6.07
Fri.	31	4.47	6.07

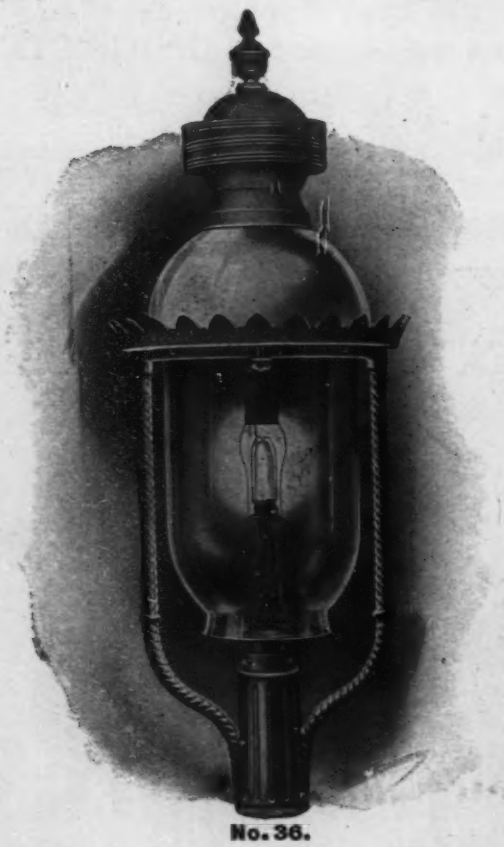
TOTAL HOURS DURING 1908.

	Hrs.Min.
January	481.50
February	329.15
March	351.50
April	341.50
May	233.05
June	218.10
July	282.55
August	254.55
September	292.25
October	420.45
November	374.30
December	411.05
	3992.35
Deduct on account of 50 min. extinguish'ag time	30.30
Total, yr.	3962.05

NEW YORK, 318 West 42d Street.
BOSTON, 820 Beacon Building.
PHILADELPHIA, Broad and Arch Streets.
ST. LOUIS, 712 Roe Building.
CHICAGO, 218 La Salle Street.
SAN FRANCISCO, 512 Oak Street.

WELSBACH STREET LIGHTING COMPANY

....OF AMERICA....



No. 36.

Controls and Operates the **Welsbach System of Street Lighting,**

Which includes its specially DESIGNED and PATENTED BURNER for PARK LIGHTING exclusively.

Uniformly SUCCESSFUL in 150 Cities and Towns.

By means of the Welsbach System of street lighting the superiority of GAS over electricity for street lighting has been fully demonstrated.

POINTS OF MERIT:

It is { Economical, Attractive, Successful, Up-to-date.

IT LIGHTS THE STREET.

Where there are no gas mains we can furnish an equally good light by our SELF-GENERATING NAPHTHA WELSBACH BURNER, and thereby supply a uniform light in all localities.

Correspondence Solicited from Gas Companies and Others interested in Municipal and Outside Lighting.

No. 38.

INVERTED REFLEX TRADE MARK GAS LIGHT

Succeeds and Excels the Electric Light at One-Quarter the Cost.

THE BURNER.

Elegance of Appearance.
Best Possible Material and Workmanship.
Perfect Combustion.
Lowest Gas Consumption.
Highest Candle Power.
Will Fit Any Fixture.
Will Not Flash Back.
Will Not Blacken Mantles.
Will Not Discolor Fixtures.
Will Not Discolor Ceilings.

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Best Welsbach Quality.
Extra Strong and Durable.
Highest Maintained Candle Power.
Rich Mellow Light.

THE GLASSWARE.

Highest Quality Imported.
Special Design Inner Cylinder (No. 317).
Protection from the Falling of Heated Particles.
Increases Candle Power.

Manufactured by

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Salesrooms in all leading cities of the United States.

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The United Gas Improvement Company,

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LARGEST BUILDERS OF

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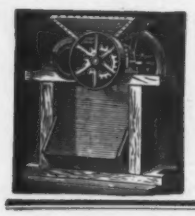

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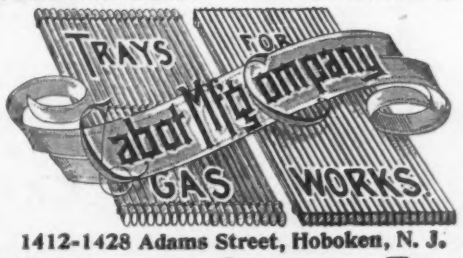

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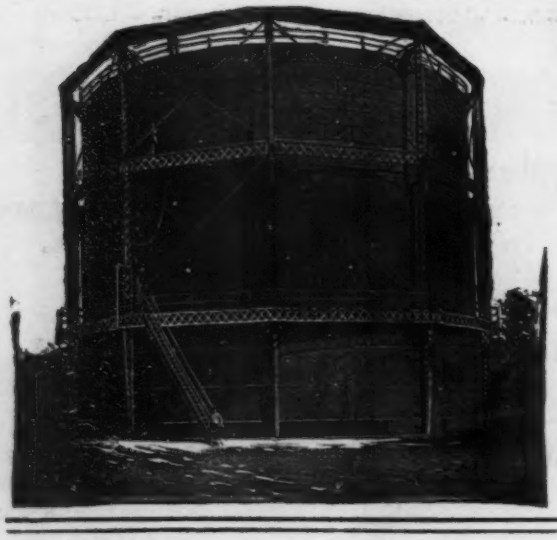

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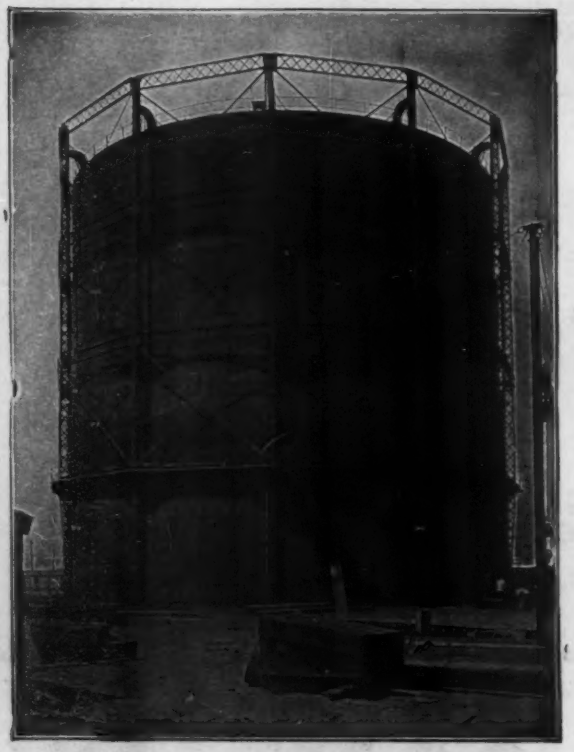

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